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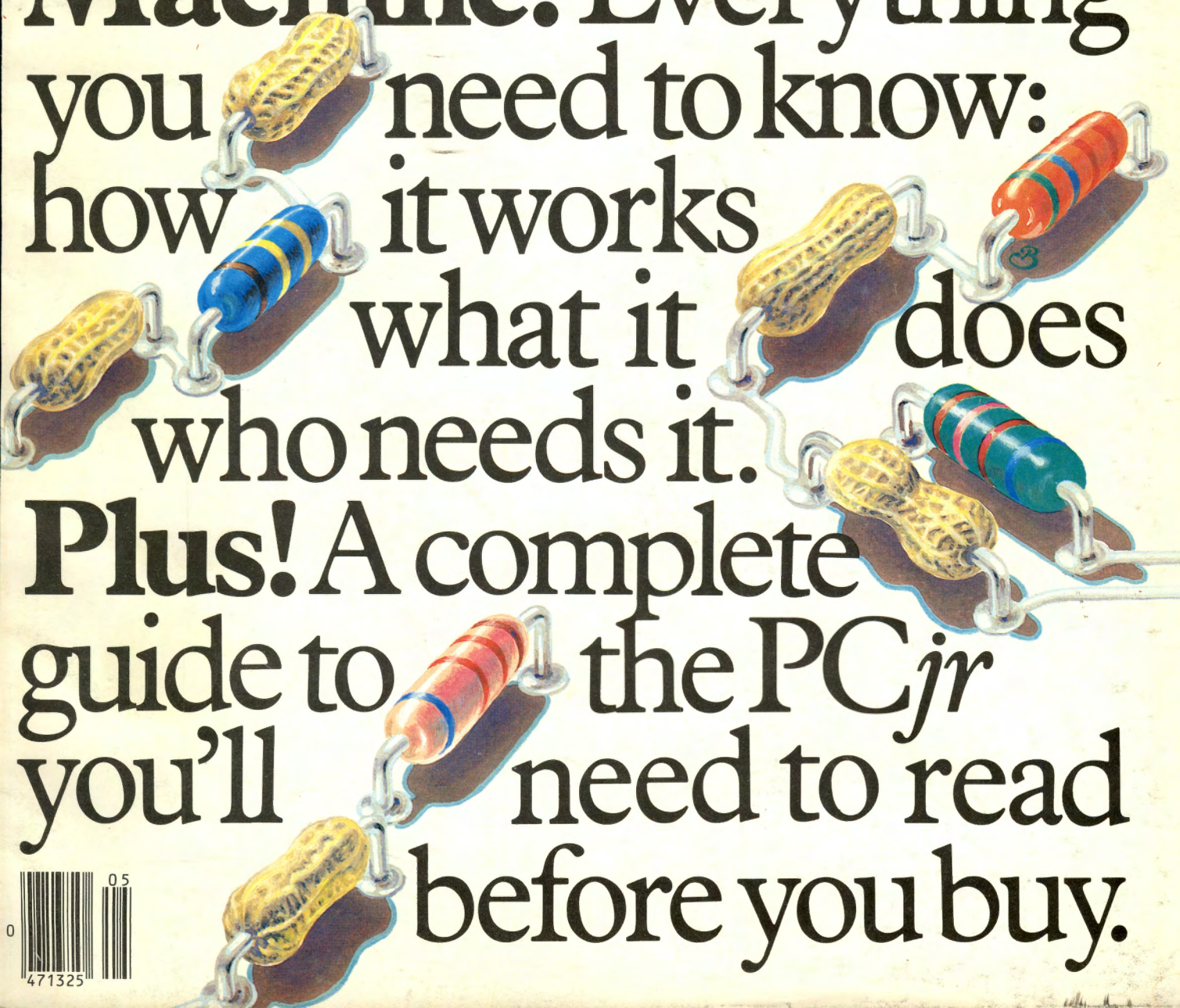
THE MAGAZINE FOR IBM PC*jr* USERS

$3

VOL. 1 NO. 1

MAY/JUNE 1984

The New IBM Home Machine. Everything you need to know: how it works what it does who needs it.



Plus! A complete guide to the PC*jr* you'll need to read before you buy.

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ANNOUNCING A PROUD ADDITION TO YOUR FAMILY.

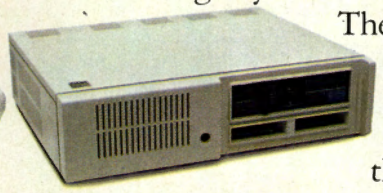
The next addition to your family could be the bright little newcomer in the growing family of IBM® personal computers.

Name: PC*jr*. Weight: 12 pounds. Heritage: more than 30 years of computer experience.

"Junior" is a powerful tool for modern times. Yet it's simple enough for a child to enjoy.

BRINGING HOME BABY

It's a big day when PC*jr* comes home.



The surprises begin the moment you open the carton.

Surprise #1 is the IBM "Freeboard"—a keyboard that doesn't need a connecting cord. The Freeboard frees you to move around and relax.



Then there's the Keyboard Adventure—an instructional exercise for first-time users. It's built into the computer and explained step-by-step in the Guide to Operations. It will help anyone begin learning as soon as PC*jr* is hooked up to a TV set.

In systems equipped with a diskette drive, there's a program that lets you explore computer fundamentals at your own pace, with PC*jr* as your teacher.

And to get you off and running from the very first day, a sample diskette with eleven useful mini-programs (ranging from a spreadsheet for monthly expenses to a word game and a recipe file) is also included.

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FAMILY COMPUTING MADE EASY

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And when the work is finished (or perhaps before), the fun can begin. Just slip in a game cartridge and stand back.

GROWING UP WITH JUNIOR

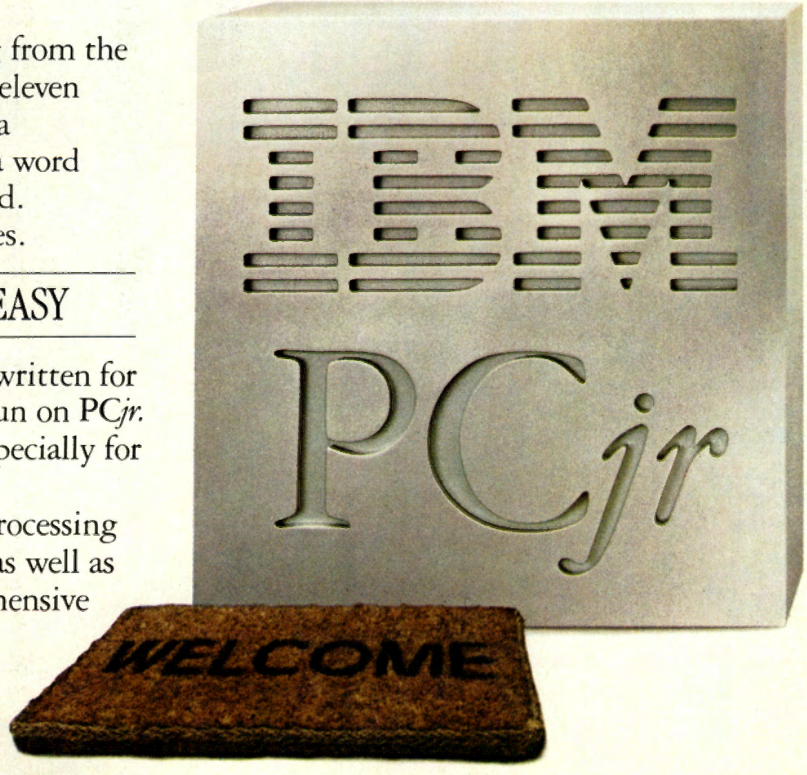
Add a printer. A diskette drive. An internal modem for telecommunications. Increase user memory from 64KB to 128KB. With these and other add-it-yourself options, even the lowest-priced PC*jr* can grow up *real* fast.

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Your local authorized IBM PC*jr* dealer proudly invites you to see this bright little addition to the family. For the store nearest you, just call 1-800-IBM-PCJR. In Alaska and Hawaii, 1-800-447-0890.



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Peanut

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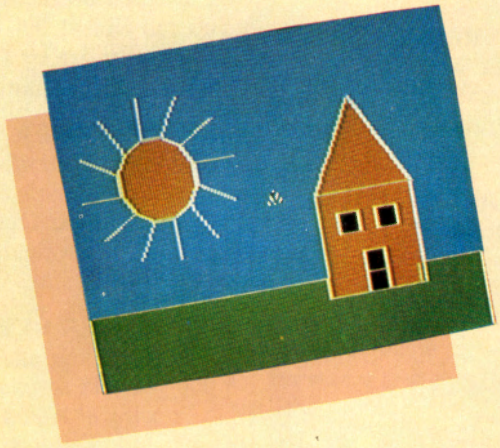
COVER ILLUSTRATION BY CHRISTOPHER BLUMRICH

Peanut

MAY/JUNE 1984 VOLUME 1 NUMBER 1

SOFTSELECT

A GUIDE TO PROGRAMS FOR THE PC*jr*



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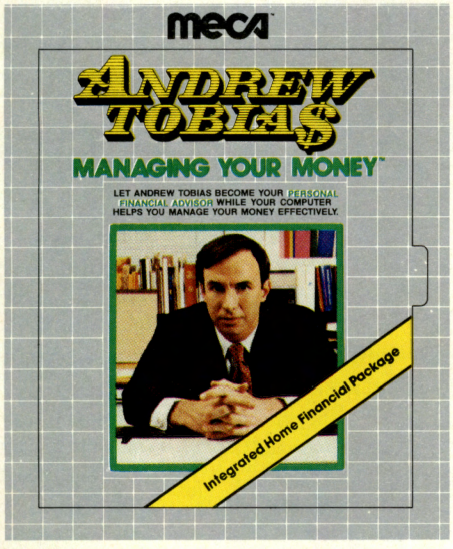
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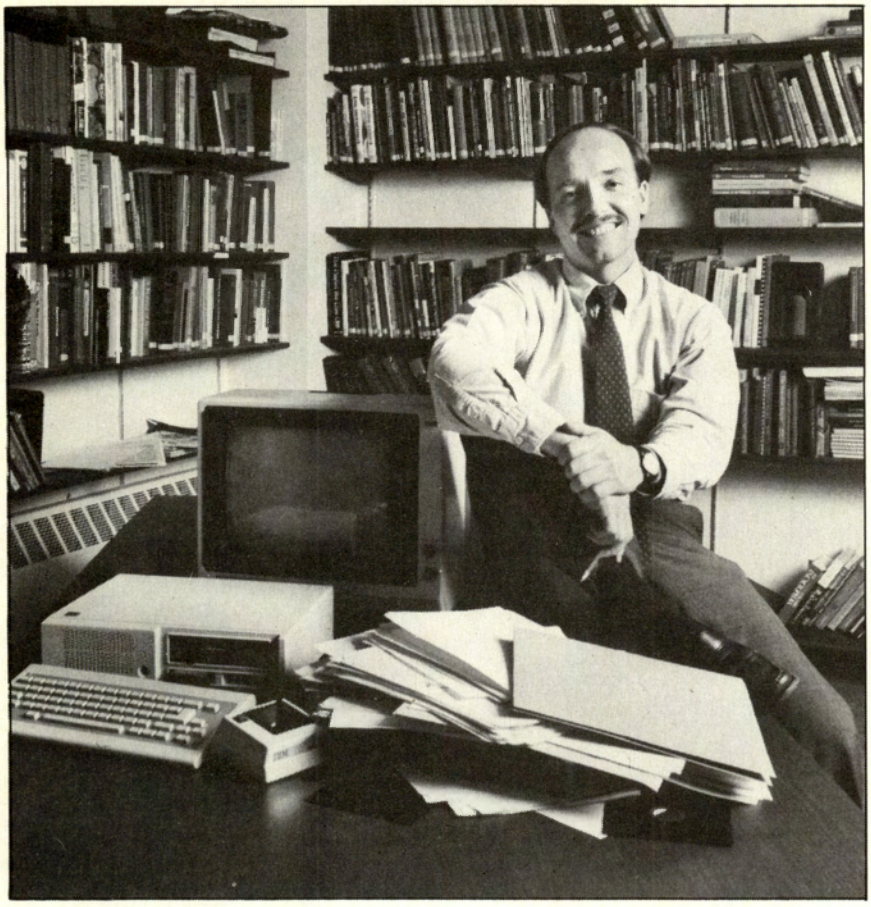
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IN A NUTSHELL



Meet PEANUT: the Magazine and the Machine

Your curiosity about the IBM PC*jr*, or perhaps your purchase of it, has put this first issue of PEANUT in your hands. We think this feature-packed edition will answer a lot of the questions you may have about Junior.

So much has been written about the PC*jr* that it's difficult to separate the hype from the facts, the grudges from the guesses. The unprecedented buildup before its unveiling set up both the computer and IBM for some inevitable potshots.

A frequent complaint is that IBM's new machine doesn't advance microcomputer technology—that it's just a "retread" of other companies' computers. Ironically, IBM's own marketing of the PC*jr* may be partly responsible for all the guessing about the Peanut's position in the market.

Take, for instance, IBM's print and television ads for the Junior: the new "baby" in the family, all cuddly and warm in its perambulator. If you ask us, the metaphor is wrong. The fact is, the PC*jr* is not a brand new computer. It's a small, stylish version of IBM's first personal computer—the PC—priced and packaged to appeal to a wide audience of present and potential personal computer users. It uses the same microprocessor as the PC and a PC-compatible disk operating system, which allows it to run most PC software. And, as we explain in this issue's *Complete Buyers Guide for the PC*jr (starting on page 9), the Junior can be expanded to be comparable to the PC in computing power. Add to this Junior's superior graphics and sound capabilities, its enhanced, easy-to-use version of BASIC, and IBM's new instruction booklets that are written specifically for the novice, and you have one appealing "retread."

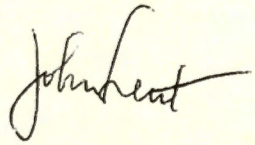
It's important to look at the big picture of the personal computer industry when assigning the PC*jr* a place in the pantheon. Computer technology has made great leaps forward in the past 30 years, but the progress has been steady. New microcomputers don't spring from engineers' heads, fully configured with the A > prompt flashing. They are built from past successful designs. The latest advances have made computers accessible, affordable, and easier to use.

The PC*jr* fits nicely into this progression. It may not be state-of-the-art, but it's a powerful and reliable computer made and serviced by a company that has made its reputation by standing behind its products. People buy IBM computers for the same reason they buy Buicks and Toyotas instead of DeLoreans: when they need a replacement part, they want a company to be there with it.

Computer magazine publishing has closely followed the growth of personal computing. Where does PEANUT fit into this progression? We think it's time that people interested in personal computing had a magazine that's practical, stylish, understandable, and one that delivers information with the same attention to the solid principles of magazine journalism that readers expect from their newsweeklies, hobby, and service magazines.

PEANUT is a magazine that respects your reading time, and offers challenge and involvement along with its practical "how-to" editorial package.

PC*jr* users deserve a new kind of magazine. PEANUT promises to deliver.



"The IBM® PC*jr* is here and only one company has all its courseware ready to run on it. Us."

Ed Brennan, President
Classroom Consortia Media, Inc.



The PC*jr*—IBM's entry into the low-priced home and school computer market—was long awaited by the entire industry, including producers of educational software. CCM® didn't wait. We acted.

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C. F. PAYNE



PEANUT'S COMPLETE BUYERS GUIDE FOR THE IBM PC*jr*

MARIAN GOLDMAN



Junior Joins the Family

The PC*jr* was the subject of more pre-release gossip and speculation than any computer in history. From the first hint of a code-named "Peanut" right up until the day IBM unveiled the machine, computer enthusiasts and the computer industry press kept busy trading the latest rumors about Big Blue's new baby: its power, appearance, price, and possible market.

When IBM opened the doors of its Madison Avenue product center in New York City on November 1, 1983, it gave the world its first peek at the PC*jr*. Everyone got a look at IBM's entry into the "lower" end of the microcomputer market, either first hand or on television during the next few days. And so the guessing was over. All anyone could do was wait for IBM to start shipping. Right?

Dead wrong. In fact, the real second-guessing about the Junior had just begun. Here's a rundown of the hottest topics of debate since November 1:

The keyboard. Discussions centered on its compact size, slippery keys, slow typing action, and infrared connection. Surely, said the keyboard critics, IBM would reconsider and release Junior with a more "professional" keyboard.

Expandability. Take the top off Junior and you see an efficiently designed but crowded system unit. IBM saved space and weight wherever possible, but left little room for the Junior to grow. There's space for one disk drive and three expansion slots, for the memory and display expansion card, the internal modem, and disk controller.

Compatibility. Just how well does the Junior fit into the IBM PC family? PC*jr* runs an update of MS DOS—Version 2.1. Which PC software runs on the Junior?

The Junior's market. All this guesswork leads to the key question—who will buy the PC*jr*? Has IBM designed a computer for home use, for schools, or for business? Here's a little prophecy of our own.

The PC*jr* will set a standard for home and school computers the same way the IBM PC set the standard for business microcomputers. True, it's a pricey home computer, but it's a machine people know will be around for a good long while, built by a company that is in the market to stay.

As for Junior's performance in schools, IBM has stated that it intends to make PC*jr* the number one computer in elementary and high schools. And the PC*jr*'s excellent color graphics and sound generating capabilities make it a wonderful machine for which to program educational software.

This is not to say that the Junior won't find its way into corporate offices and small businesses. It will show up in large offices most likely as a smart terminal in local area networks, and its 128K memory and one disk drive are enough for some small businesses.

Enough speculation. The COMPLETE PEANUT BUYER'S GUIDE is not a compendium of predictions, but rather the one place you can find all the information you need to make a wise PC*jr* purchase. PEANUT editors put the machine through its paces during hours of tests. We talked with the people who designed it and the dealers who will sell it. The BUYER'S GUIDE spells out the complete PC*jr* specs and gives you an update on software that's available for the PC*jr*.

But Junior's vital statistics mean little on their own. Our BUYER'S GUIDE explains, in nontechnical, jargon-free language, what the precocious Peanut can actually do for you. We introduce you to each important feature of the PC*jr*, every piece of add-on equipment, and all types of software. Then we look at how people like you, from eager beginner to techno-wiz, might put the Junior to good use. ■



Jr.'s Report Card

PEANUT put the Junior through a battery of tests to come up with its first report card and it passed in every subject, though not always with flying colors. In assessing and reporting on Junior's performance, we invoke a teacher's favorite cliche, "There's always room for improvement." But that can't hide our obvious excitement about the Junior and its prospects for the future.

After many hours of working on the PC*jr* and poking around inside it, we are convinced it is a computer ideally suited for use in homes, schools, and, with some modifications, in offices. But every teacher knows that a student's success in the classroom (in Junior's case our editorial offices and the product review room at IBM in Boca Raton, Florida) doesn't inevitably translate into success in the big world outside of school.

Junior's real test is not with editorial boards, but with software publishers, peripheral manufacturers, and of course, consumers. Early signs indicate that software and hardware companies think the Peanut is a winner. Most of the companies that make products compatible with the IBM PC and have cashed in on the success of IBM's first personal computer are lining up with similar products for the PC*jr*.

The likelihood of a huge software library and hundreds of expansion hardware products are two very good reasons to buy the PC*jr*. But no matter how powerful or easy it is to use a microcomputer, it can come and go from the market with barely a whisper if it doesn't catch the buyer's eye. We think the PC*jr* will catch a lot of buyers looking twice. Junior is sleek and stylish, but still looks and feels like a computer capable of hard work. Junior breaks tradition with its featherweight, infrared keyboard, but it also carries the familiar and trusted IBM logo.

The report card takes a look at how the PC*jr* performs in eight key areas. This is one Junior that you don't have to claim as your own until *after* you've seen its first report card.

Language skills. Cassette BASIC is identical to the ROM BASIC in the IBM PC and XT microcomputers. It resides permanently in PC*jr*'s read-only memory and is standard on both the entry and enhanced versions of the Peanut. The major drawback of Cassette BASIC is that information and programs entered in this language can be saved only on a cassette tape recorder, which operates very slowly.

Cartridge BASIC comes on a separate ROM cartridge that fits into either one of the cartridge slots in the front panel of the PC*jr*. It is compatible with PC*jr*'s disk operating system (PC DOS 2.1) so its programs and files can be saved on a disk. It also has additional statements for using advanced graphics, music, the serial port, joysticks,

Early signs indicate that software and hardware companies think that the Peanut is a winner.

the internal modem, and extra screen modes.

PC*jr*'s BASIC Compiler transforms programs written in Cassette or Cartridge BASIC into a form that allows the programs to operate much more quickly. However, no DOS 2.1 features and only some Cartridge BASIC features are in the compiler, so not all programs written in BASIC on the Junior can be compiled.

Logo is a computer language that is popular in education. IBM Logo contains most of the features of the language, including turtle graphics, recursion, and list processing. The only drawback of IBM Logo running on the PC*jr* is its slow operating speed.

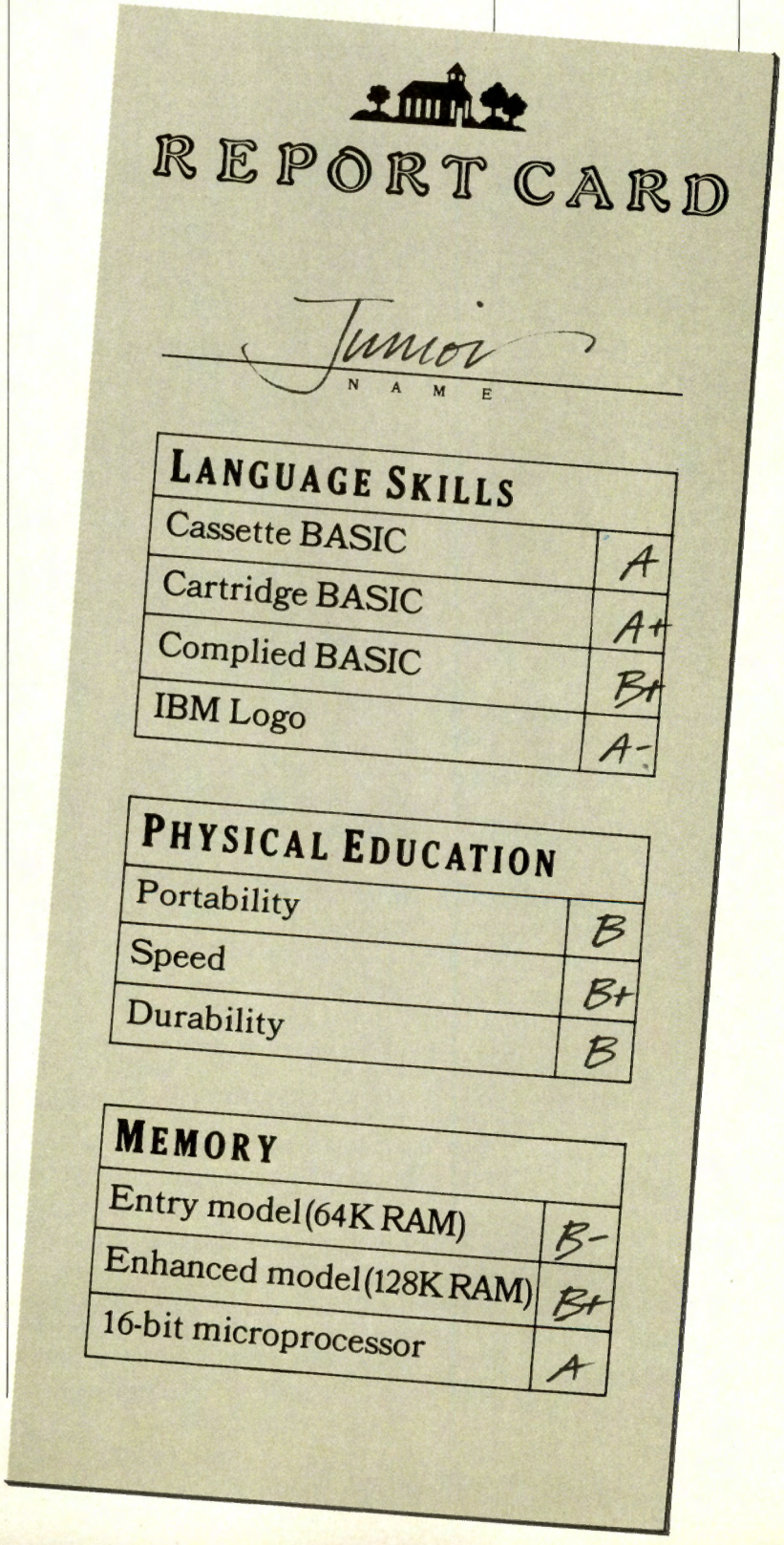
Physical education. Junior is compact, lightweight, and easily transportable in its carrying case or shipping box. But it is not a true "portable" computer, because it is not a self-contained unit that you can pull out and work with on your lap. Junior's compactness leaves little room for expansion within the system unit—there are no "open" internal expansion slots. Buyers who like Peanut's small size but plan to expand its capabilities will have to forfeit either compactness or power.

Junior's 16 bit microprocessor makes it a quick operator. Junior performs calculations, and sorts and retrieves information much faster than many home computers that use an 8 bit design.

All the components of the PC*jr* have a solid "feel" and should hold up as well as any microcomputer. However, the top of the system unit is not designed to support the weight of a monitor, so your display will have to sit to the side of the Junior.

Mathematics. Junior, along with the other microcomputers in its class, has been placed in a special section for the gifted and talented. As far as we know, Junior has never missed an arithmetic problem. The credit for such mastery goes to the built-in BASIC that gives Junior a full range of numerical functions: addition, subtraction, multiplication, division, square root, sine, cosine, and many others.

Memory. The PC*jr*, like all personal computers, advertises its RAM (Random Access Memory) as a gauge of its computing power. But the entry level Junior's 64K RAM and the enhanced model's 128K are misleading figures. The moment you turn on the PC*jr* you lose some of the available RAM. The video display grabs 16K, Cassette BASIC 4K, Cartridge BASIC another 2K, and



MUSIC	
PCjr with Cartridge BASIC and external speakers	

MATHEMATICS	
Numeric functions	A

COMMUNICATIONS SKILLS	
IBM Internal modem	A
Serial port	A
Parallel port	B

SOCIAL SKILLS	
Compatibility with IBM PC	A

GRAPHICS/ART	
Entry level (with Cartridge BASIC) Low and medium resolution graphics	B
Enhanced model (with Cartridge BASIC) Low, medium, and high resolution graphics	A

DOS 2.1 takes a whopping 24K. So, while you may think your PC*jr* has 64K or 128K of RAM available to load programs into, you may have as little as 42K in an entry machine and 82K in an enhanced model.

The PC*jr*'s Intel 8088 16 bit microprocessor can work with up to one megabyte (one million bytes) of memory. Most home computers use an 8 bit processor. The Junior's 16 bit processor means that programs written for the PC*jr* can contain more information and will run faster than those programs written for an 8 bit machine.

PC*jr* is the only IBM personal computer that does not use parity checking circuitry. Parity checking tests a computer's RAM chips to see that they are storing data accurately. The PC*jr*'s lack of parity checking may result in an occasional unexplained "error message" appearing on the screen. The only way to fix such an error is to turn off the computer and start again.

Graphics/art. Junior moves to the head of the class when the subject is color graphics. Junior's graphic capabilities come from its Cartridge BASIC and the enhanced model's memory and display expansion board.

With Cartridge BASIC loaded, an entry model connected to a color TV can be programmed in two graphics modes. In the first, there are 16 available colors and the screen is divided into 160 horizontal *pixels* (pixels, short for picture element, are the small dots that make up an image on a display screen. The more pixels, the higher the *resolution*, and the sharper the image) and 200 vertical pixels. This is a low resolution mode. The second is a medium resolution mode with four colors and a display of 320 horizontal pixels and 200 vertical pixels.

Junior's enhanced model with Cartridge BASIC and a color monitor has one medium resolution mode—sixteen colors, 320 × 200 pixels. The other two graphics modes are both high resolution—640 × 200 pixels—one with two colors, the other with four.

Cartridge BASIC also adds nine new graphics statements to the Junior's artistic repertoire: CIRCLE, PUT, GET, PAINT, DRAW, VIEW, WINDOW, PALETTE, and PALETTE USING.

Music. Junior's music-generating abilities break new ground for programmers of educational and game software. The keys to elaborate, yet easy music making with the PC*jr* are its special sound chip and Cartridge BA-

It is a computer ideally suited for use in homes, schools, and, with some modifications, offices.

SIC. The chip generates the sounds and Cartridge BASIC gives you some powerful statements that make putting sound into programs quite easy. Music statements include NOISE, SOUND, PLAY, and ON PLAY.

The PC*jr* alone can be programmed to play music and generate all manner of sounds, but without external speakers you won't hear much. Junior is equipped with only a small beeper that has a very limited range of sounds. To hear the full sound potential of the Peanut, you have to connect Junior to a TV or to separate speakers.

Communication skills. Many practical home and office uses of a microcomputer require communication between computers. Junior is ready and able to "talk" with other micros and with databases stored on main frame computers by sending and receiving information over the phone lines.

The IBM internal modem (a device that changes the computer's code into signals that can be sent over the phone lines) fits neatly into the expansion slot reserved for it in the Junior and it performs all the usual communications functions. Non-IBM modems can connect to the Junior through its serial port. The one advantage IBM's modem has over all others is that since it can be plugged directly into the Junior's "motherboard" (the main circuit board), it leaves the serial port free for other add-on equipment such as a printer. With an inexpensive connector, Junior's serial port can hook up with any standard RS232 device.

PC*jr*'s parallel port, a module that plugs into the right side of the system unit, is important to the Junior's ability to communicate with peripheral equipment, especially with printers. The only drawback to Junior's parallel port is that it costs an extra $100.

Social skills. Just how compatible are the IBM PC and its upstart sibling? They seem to be matched quite well. Junior will run almost all PC software that requires only 128K and one disk drive. PC owners seeking a less expensive but powerful second computer that will run PC software will be pleased with the Junior. ■



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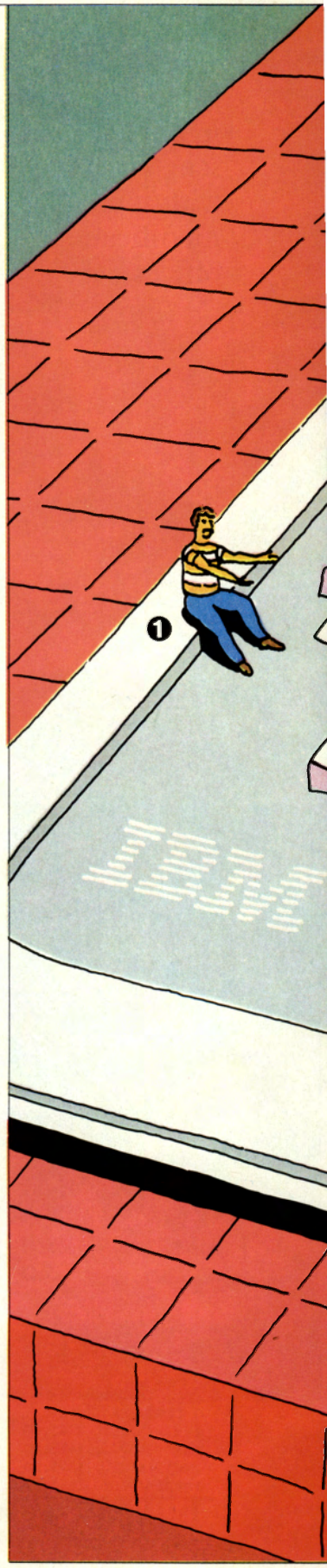
UNLEASH THE Graphic POWER of the
IBM PC XT IBM PC IBM PCjr

LENIPEN/XT is an enhanced version of the popular LENIPEN Color Graphics System

Circle No. 109 on Reader Service Card

The Keyboard

Innovation or gimmickry? Much ado about infrared and little blank keys.



The PC*jr*'s keyboard is the object of more debate than most people would imagine any piece of computer equipment worthy of, especially one that's so small, lightweight, and relatively attractive. The features of the keyboard causing the biggest stir are the infrared link to the system unit and the size, shape, "feel," and appearance of the keys themselves.

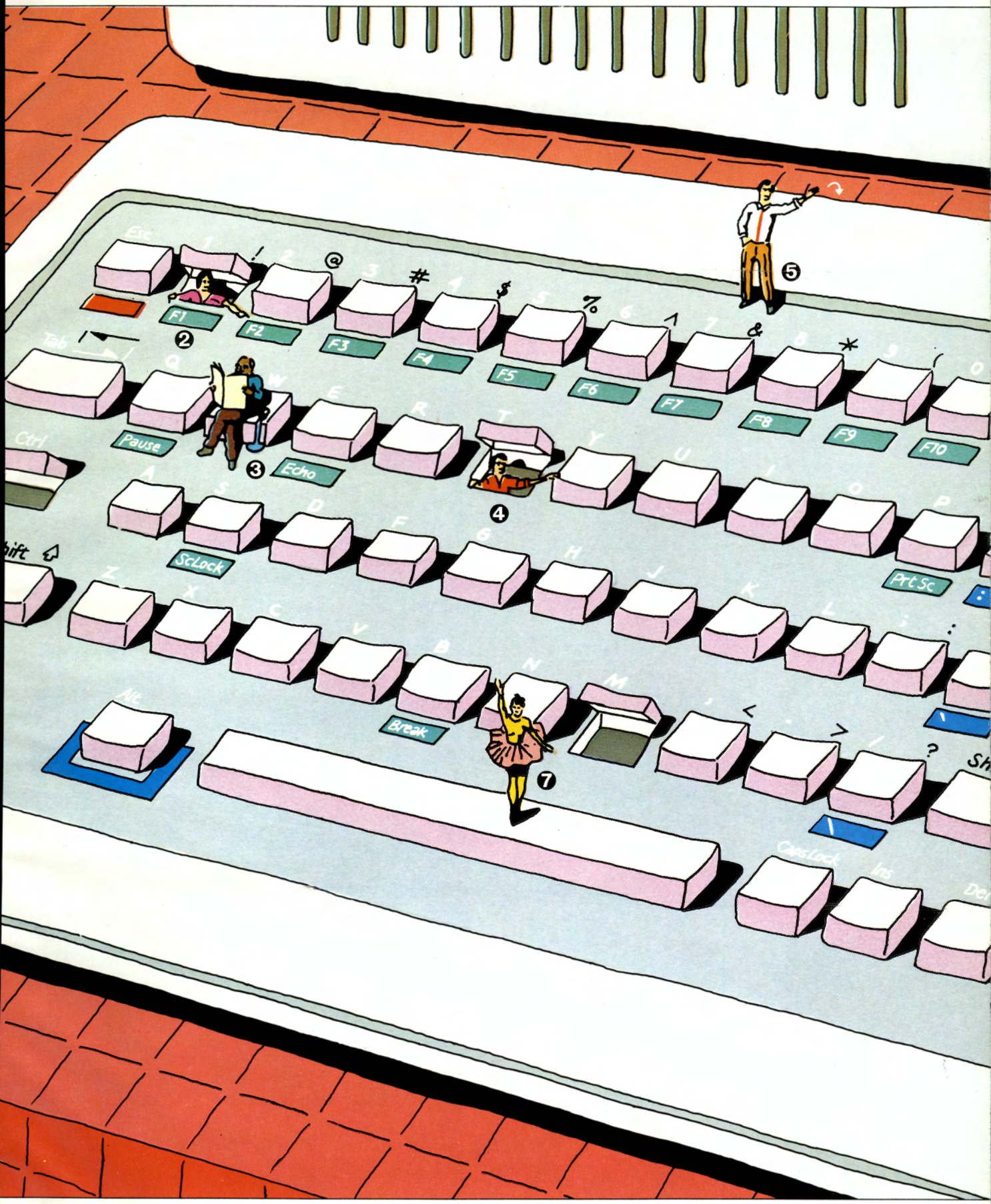
Let's look first at the infrared feature. The PC*jr* is the first microcomputer with a wireless keyboard. Instead of the usual cord that links a detachable keyboard with the computer itself, PC*jr* has two diodes on top of the keyboard that emit infrared signals to an "eye" on the system unit. The keyboard is powered by batteries. IBM did not invent this technology, but it is the first to make it standard equipment on a microcomputer. Why did its engineers do this?

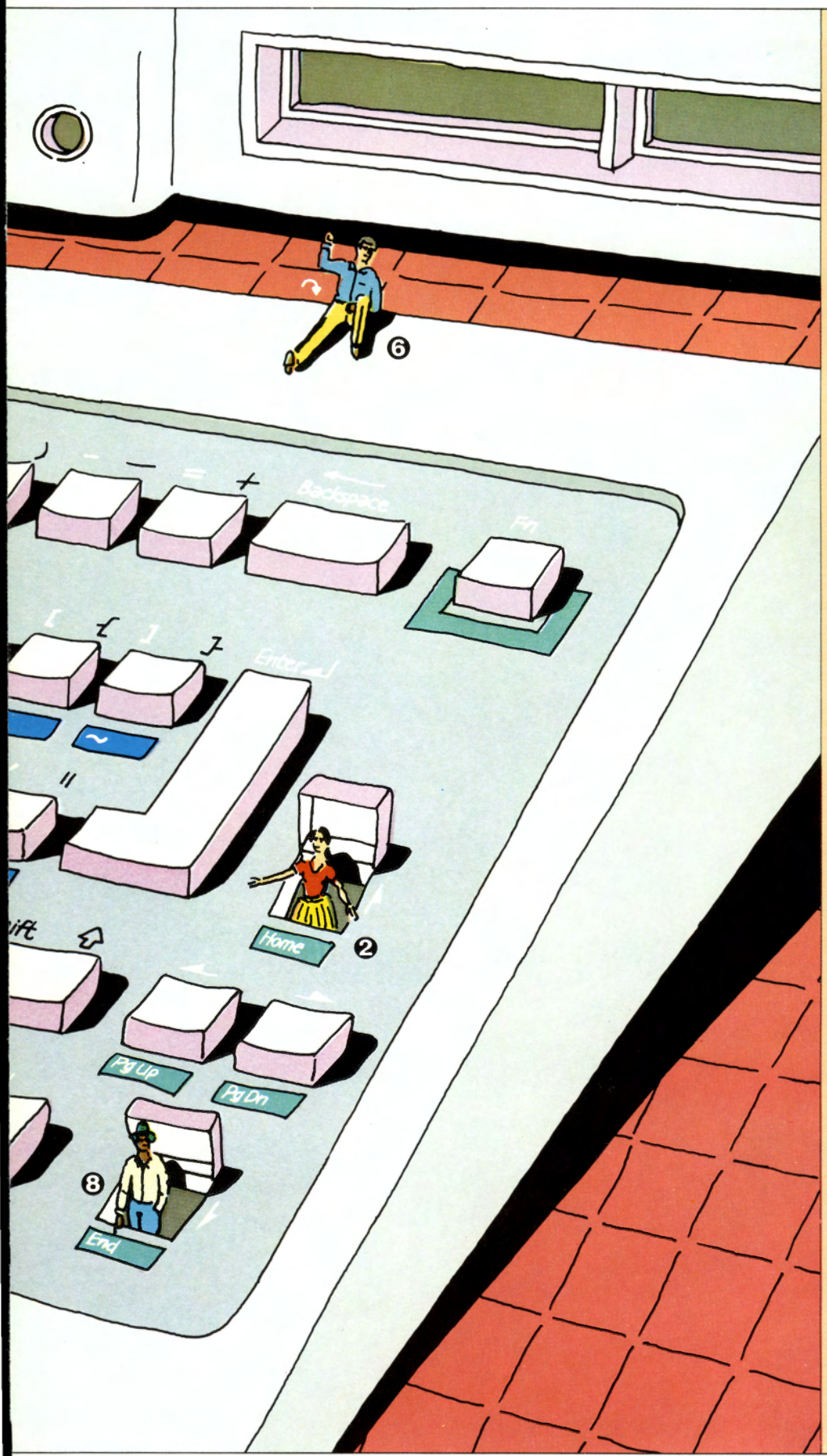
Ask IBM why and they'll tell you that this keyboard system gives users much more flexibility in where and how they use the PC*jr*. Now you can use a home computer while sitting in your favorite easy chair, as long as its not more than 20 feet away from the system unit and you keep the diodes pointed directly at the computer. There can be no physical barriers between the keyboard and the computer. (That includes moving barriers such as a dog, as one PEANUT editor found out.)

A helpful feature is the beep that sounds when you send a signal that misses its mark so you know to press a key again. Good thing the beeper lets you know, because at 20 paces from the TV or monitor, you sure won't be able to see if a character has come up on the screen.

If you choose to sit up close to the computer where you can read the screen, it's nice to be able to lay the keyboard in your lap and type away. But in that position the infrared eyes don't match up, unless you have much longer legs than most of us and can get the keyboard up high enough to clear the edge of the table that the system unit is sitting on.

Short legs and a dog in the house are not the only things that make a cordless Junior impractical. Household


Esc
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
Tab
Pause
Ctrl
Echo
ScLock
Prt Sc
Break
Alt
CapsLock
Ins
2
3
4
5
7



SPECIAL FEATURES

❶ **All 62 keys may be programmed individually.** Plastic or cardboard overlays indicate new key designations.

❷ **Consolidated keyboard layout.** Special function key operations require two keystrokes. Four special cursor control keys are set apart in lower right corner.

❸ **The spill-resistant surface** requires caution but still stands up to spills better than most keyboards.

❹ **Sculpted, plastic keys.** Their action, which is called "¾ travel," gives keys a less professional feel.

❺ **Cordless option.** Keyboard sends signals to system unit through two infrared transmitters located at the top of keyboard. Standard cord is available and, for our money, recommended.

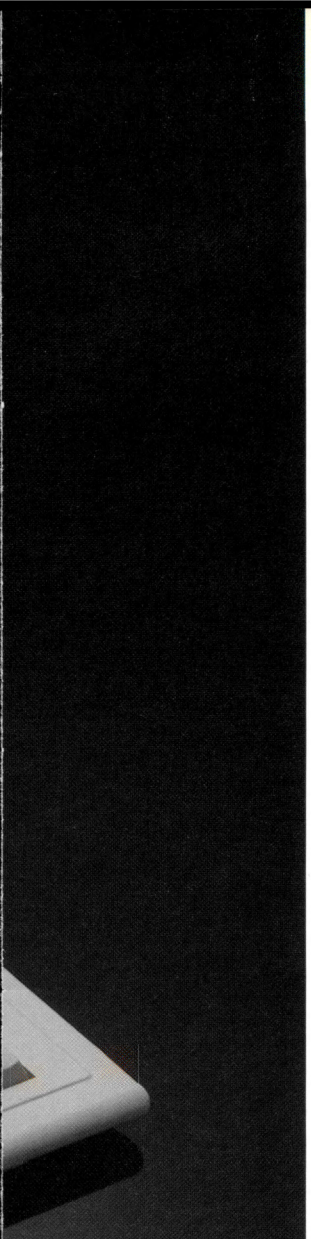
❻ **Cordless keyboard is operated by four AA batteries.** The keyboard is energy efficient because it uses power only when a key is pressed.

❼ **Lightweight** (25 ounces with batteries installed) and small (just over a foot long and six inches wide), the keyboard is easy to transport.

❽ **All keys are unmarked.** Key designations are printed between the keys on the housing.

PETER ROSS


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Forget the infrared; buy the cord, plug it in and leave it in.

items that might use the same frequency as the Junior, such as remote controllers for televisions, video cassette recorders, and stereos, may interfere with signals you are sending the computer. Any time there are two or more PC*jr*'s in a room, you run the obvious risk of one keyboard sending a signal to the wrong computer. Imagine a classroom, where Jimmy is hard at work on his geography tutorial, but Dennis the Menace is at his worst. Dennis points his infrared signal at Jimmy's console and Zap! In go the wrong answers. Schools are certain to nix the infrared and plug in the optional cord.

And there may be trouble even if only mature adults who would never dream of playing a little shoot-em-up with a computer use the cordless keyboard. Those infrared signals can bounce off plate glass windows, marble walls, mirrors, and perhaps even highly shined shoes! PEANUT goes on record: the cord should be standard with the PC*jr*, and the "beam me up, Scotty" gimmick left as the option. Forget the infrared; buy the cord, plug it in and leave it in.

The loudest criticisms of the keyboard are that the keys are not like those of a typewriter and they are therefore harder to use, and that the tops of the keys are blank. The character or "function" of each key is printed on the keyboard housing, above the key. Let's take a look at the keys' shape and "feel" first.

The Junior's keys are rectangular, plastic nubs with slightly sculpted dish tops. They require a bit more pressure to operate than standard electric typewriters or most personal computers. This slightly stiffer feel is attributable to the dome-shaped hard rubber supports that each key rests on. Those rubber domes make the keys bounce back after being pressed, but they do not respond with the familiar click of a typewriter when the electrical connection is made.

If you're used to typing on another keyboard, you'll need a short period of time to feel comfortable with the PC*jr*. But children and adults who have never typed much will have no difficulty getting started with the Junior's unique keyboard.

The PC*jr*'s keys are spread out nicely on the board, which makes it easy for hunt-and-peck typists to find their targets. But why were the keys left blank? All of the keys on the Junior are "programmable," which means that different programs can redefine what character any key will "type" on the screen. The blank keys and their wide-open spacing on the board allows you to use keyboard overlays that fit over the keys and show the new function each key has after you load the software. For example, an educational program for young children might program the keys so they run in alphabetical order from left to right, making it much easier for a child to find the right key. Or a word processing program may include an overlay that shows the purpose of each function key.

The other significant features of the keyboard are its size and weight and the actual number of keys. The Peanut's keyboard weighs just 25 ounces with the batteries installed and measures just over a foot long and about six inches wide. While the keyboard's very small "footprint" makes it easy to store and carry, it also limits the number of keys that will fit on it.

The Junior's older siblings in the IBM personal computer family, the PC and the XT, each have 83 keys. The Junior has 62 keys. Missing from the PC*jr* are the PC's ten special function keys and the thirteen-key numeric pad and the Num (numeric) Lock key. But Junior has some special keys of its own, including four cursor-control keys and one function key that, when pressed along with one of the numeric keys on the top row, gives you all of the special features of the PC function keys.

Our feeling is that buyers shouldn't be put off by the unorthodox appearance of the keyboard. The only way to judge its merits is to type on it. After many hours of typing with the Junior, we think it is adequate for all but the most demanding typists such as professional writers and secretaries who spend hours on word processing assignments. ■

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Entry vs. Enhanced

Maybe you've seen the cartoon where a computer salesman is making his pitch to a customer while holding a tiny microcomputer in his hand. "The entry model costs just $49.95," he says. "And if you need more oomph, there's an expansion pack available." Just over his shoulder is a box bristling with chips, resistors, and all manner of electronic whiz-bangs—tagged at $4,000.

Choosing between the two basic models of the PC*jr* won't be as traumatic as this; in fact the differences between the two models IBM is offering are easy to see and understand.

Take the top off the entry model and you see the motherboard or main circuit board with its central processing unit (both models use the Intel 8088 16 bit microprocessor); RAM and ROM chips; expansion slots and circuitry for connecting all the Junior's peripheral equipment. Other obvious features you'll see are the cartridge slots; infrared receiver; video control chips; and the small fan that keeps Junior's circuitry from overheating.

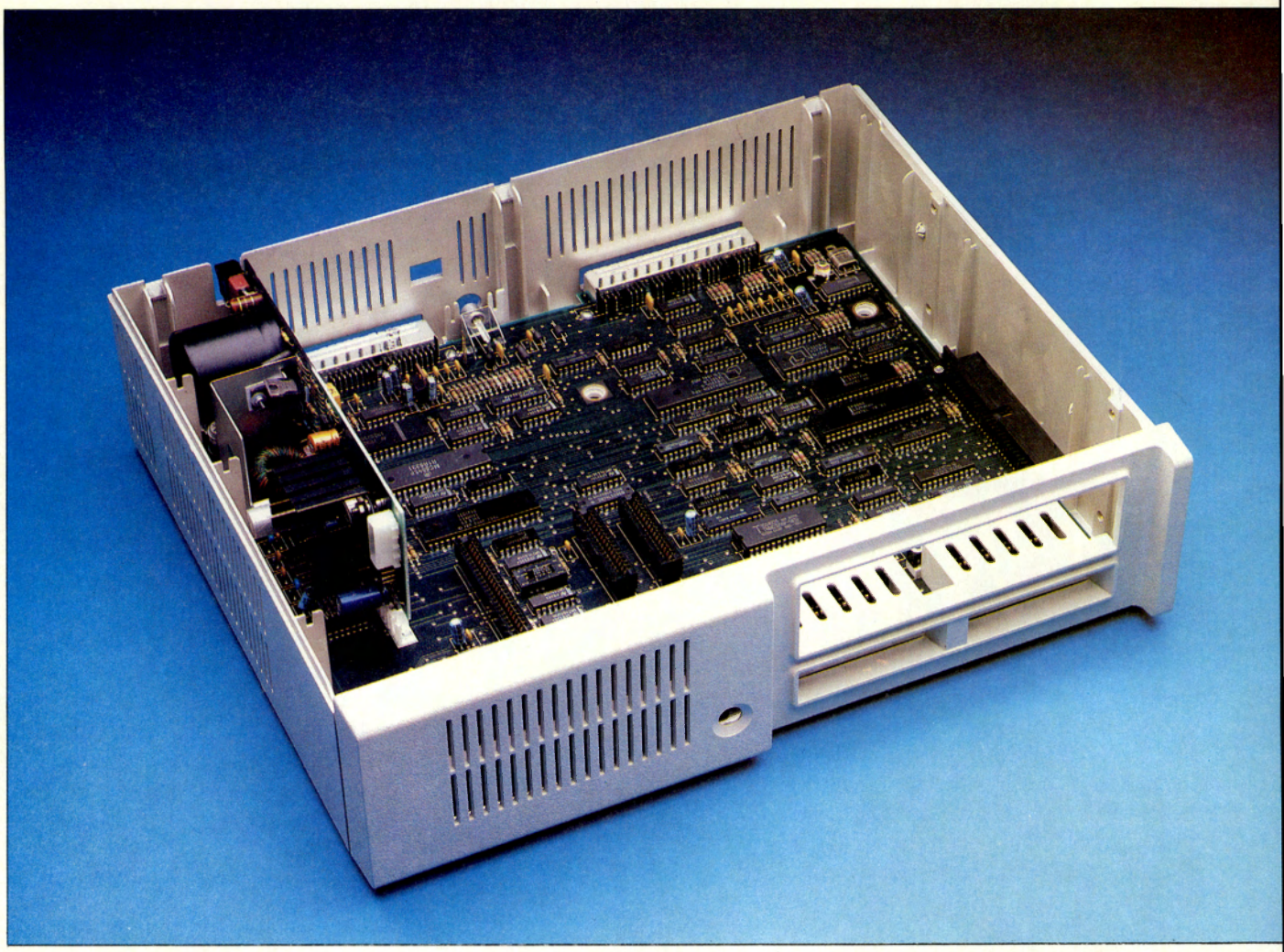
Pop the top on the enhanced model and you see a much more crowded arrangement. The most obvious additions are the disk drive with its elaborate circuitry on the right and two circuit boards added to the expansion slots—one to enlarge Junior's RAM from 64K to 128K and to enable Junior to display 80-column-wide text (the yellow box in the picture on the following page) and one to control the disk drive. There's still one slot free for the modem, which is not part of the enhanced package.

The name's the same, but the PC*jr*'s two models are very different computers.

Exactly what do the added features of the enhanced model mean to the user? Who will be happy with an entry model and which buyers should start with the enhanced? Can you upgrade the entry model piece by piece until you have the benefits of the more expensive version? We'll answer those questions by taking a close look at the match up—entry vs. enhanced.

Fresh out of its box, the entry-level machine comes with 64K RAM and Cassette BASIC. Cassette BASIC is somewhat limited in that the only way you'll be able to save programs you've written is on a cassette recorder, which you'll have to purchase separately. Cassette recorders are ponderously slow compared to disk drives and cassette tapes require more care than floppy disks. Yet, in spite of its shortcomings, a cassette recorder is an inexpensive way to get started with saving programs and information from the Junior.

Another entry machine feature important enough for immediate note is that the display is just 40 columns wide. This means that most word processing programs will let you type only 40 characters on the screen before they wrap around to the line below. This limitation, however, does not affect the printout. Even though a letter or report is



The entry model PC*jr* looks empty, but the "brain" of this new machine—the 16 bit microprocessor—is the same one used in the enhanced PC*jr* and IBM's other personal computers.

displayed 40 characters wide on the screen, the printer will still type lines up to its allotted 80 or 132 columns wide. While a 40-column display is not a serious drawback for most home-computing jobs, any serious word processing or spreadsheet analysis requires the full 80-column display.

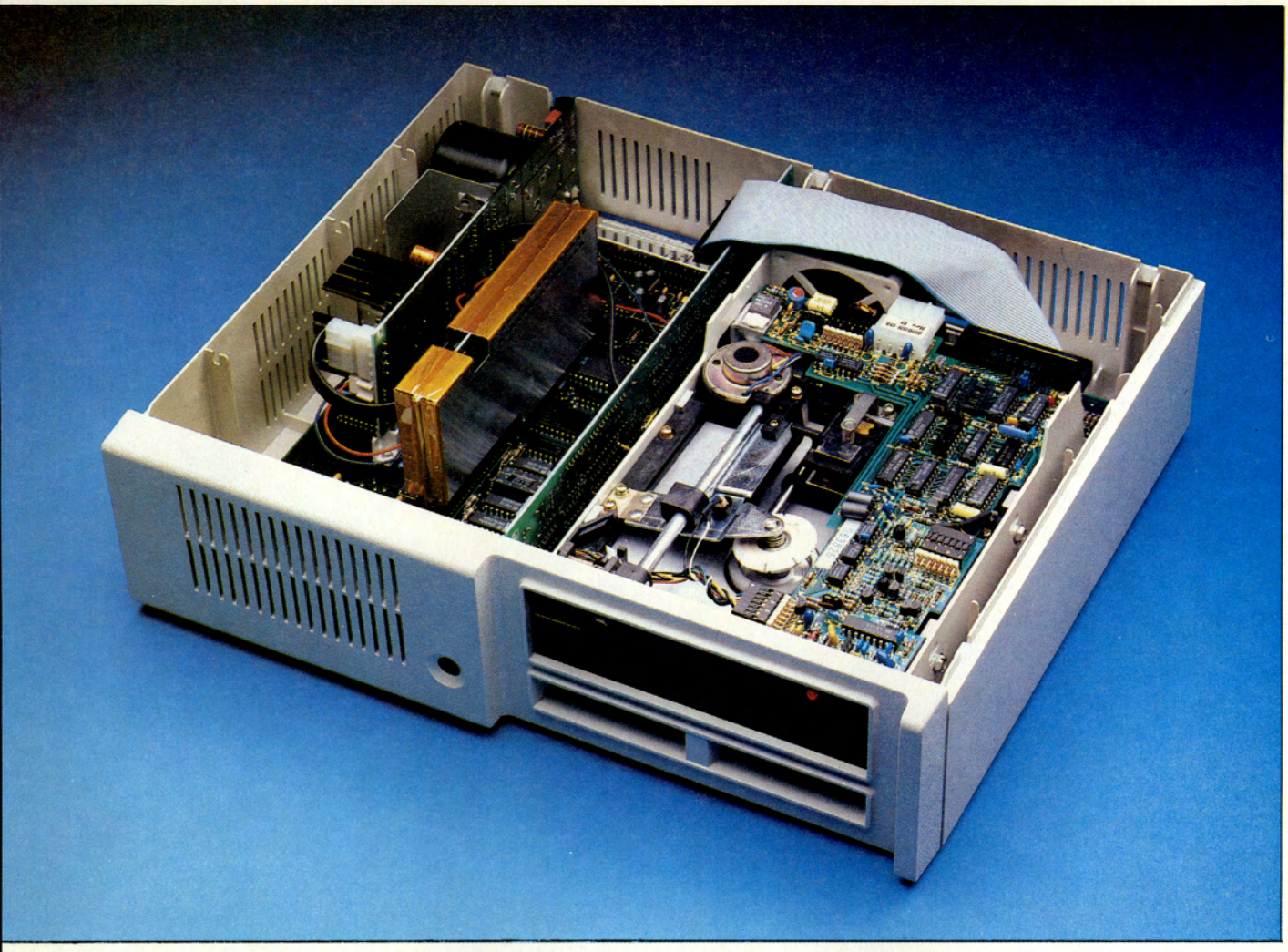
The most serious limitation of the entry model for every user is the lack of a disk drive. The entry model runs software on special cartridges and there are just a handful of education and game programs available on cartridge at the moment. Despite the merits of cartridges—durability, ease of use, and small size—floppy disks have become the standard medium for microcomputer software.

Now for a profile of the enhanced machine. It's the entry model with three very important options: an extra 64K of RAM, 80-column display, and a disk drive.

Of all the options, the disk drive is the most important. When IBM designed the PC*jr* it realized that a huge software library for Junior would be crucial to its success. So it designed the Junior to allow most of the software for the IBM PC to run on the PC*jr*. Most of those programs come on disks, not on cassette tapes or cartridges. And many of them require the enhanced model's 128K of RAM.

Even though it's not a part of the enhanced PC*jr* package, Cartridge BASIC is an unspoken necessity. If you want to write a program that reads and writes to disk, or you want to save it on disk, you need Cartridge BASIC. Also, some commercial software requires Cartridge BASIC to be plugged in for the program to run.

The 80-column display and added memory allow you to run many more programs and run them more efficiently. The expansion card also gives you



The enhanced PC*jr*, with its disk drive, extra 64K of RAM, and 80-column display ability, has much more available software than the entry model.

more space for manuscripts or files.

Now that we know what hardware each of the machines boasts, let's figure the tab for upgrading an entry level Junior piece by piece and compare it to the price of an enhanced model.

Entry level PC*jr*	$669
Disk drive	$480
80-column display and 64K memory	$140
Total for upgraded entry model	$1289
Enhanced PC*jr*	$1269
Difference	$20

From these figures, you can see that if your cash flow is tight, it still makes good economic sense to build a system as you go. (The prices used are IBM's listed retail prices. They may vary from dealer to dealer.)

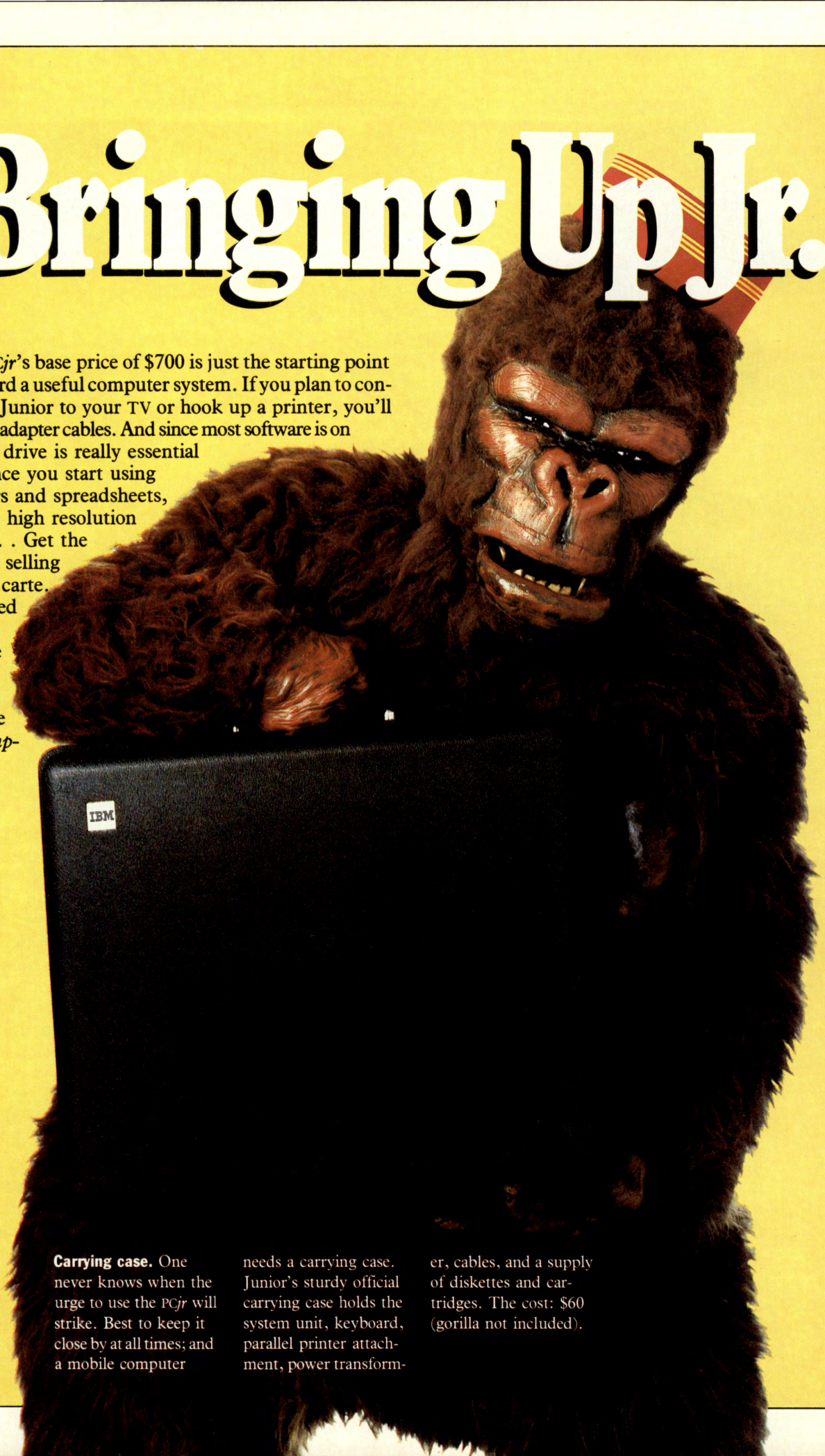
Furthermore, upgrading the Junior requires no technical skill; if you can pry the top off the system unit, you can install the expansion boards and the disk drive with no trouble. The circuit boards fit snugly into their assigned ("dedicated" in computerese) slots and the disk drive snaps right into the base of the system unit's frame. No special tools (all you need is a screwdriver) are required and there are no tiny switches to adjust. So building up an entry model PC*jr* needn't require a service call or a special trip to the computer store with Junior each time you want to step up its capabilities.

But will any users be happy with the entry model as it is sold? Is a microcomputer without a disk drive the right machine for anyone these days? The name "entry" implies that this is the best machine for computer beginners. But beginners have different potential uses for a computer at home, school, or in an office, and it is those future applications that should determine which model they buy, not just their level of computer know-how. ■

THE COMPLETE BUYER'S GUIDE

Bringing Up Jr.

The PC*jr*'s base price of $700 is just the starting point toward a useful computer system. If you plan to connect Junior to your TV or hook up a printer, you'll need adapter cables. And since most software is on disks, the disk drive is really essential equipment. Once you start using word processors and spreadsheets, you'll want the high resolution of a monitor . . . Get the picture? IBM is selling the Junior a la carte. We've assembled some common add-ons for the Junior to give you an idea of what's available and what a *complete* PC*jr* costs.



Carrying case. One never knows when the urge to use the PC*jr* will strike. Best to keep it close by at all times; and a mobile computer needs a carrying case. Junior's sturdy official carrying case holds the system unit, keyboard, parallel printer attachment, power transformer, cables, and a supply of diskettes and cartridges. The cost: $60 (gorilla not included).

PHOTOS BY MARIAN GOLDMAN

RGB monitor display of text at 40 characters per line.

RGB monitor display of text at 80 characters per line.

Television display of text at 40 characters per line.

Television display of text at 80 characters per line.

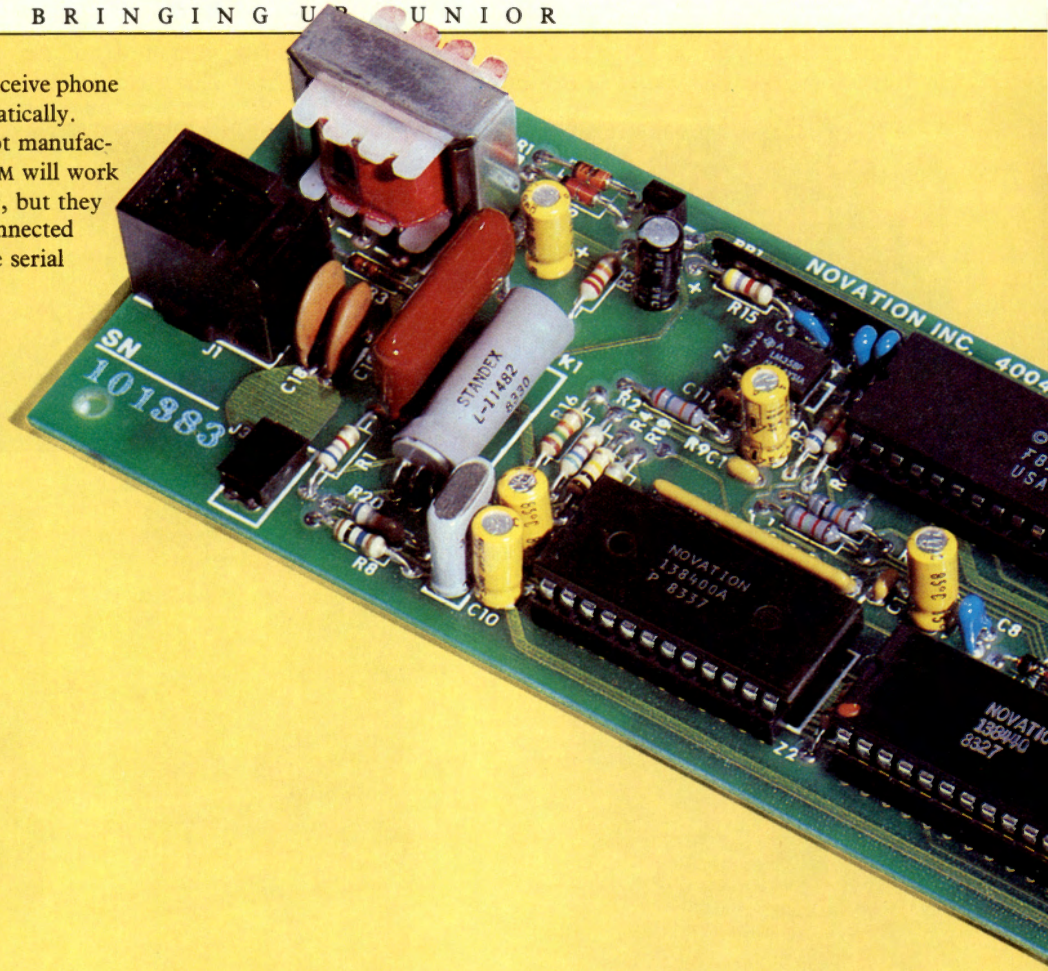


Video screen—monitor or TV. Whatever you use a PC*jr* for, you have to connect it to a video display. Provided with the proper cables, Junior will connect to a television or a computer monitor. You might want to connect Junior to your TV and see if the image is sharp enough for your purposes before you sink hundreds of dollars into a color monitor. If you plan to play video games and write an occasional letter on Junior, your TV will probably do the trick. A good color TV provides a fairly easy-to-read image when characters are displayed in 40 columns across the screen. But if you plan to log long hours with programs that display lots of text in 80 characters across the screen, such as word processing, accounting, and some educational software, you will want to invest in an RGB (red, green, blue) monitor like the one on the left. The pictures above the monitor and the TV tell the story. The multi-color effect of the TV screen is not much of a problem with the larger letters on the 40-character screen. But shrink each letter down to fit 80 characters across, and the difference is probably worth the $695 price tag on the color monitor.

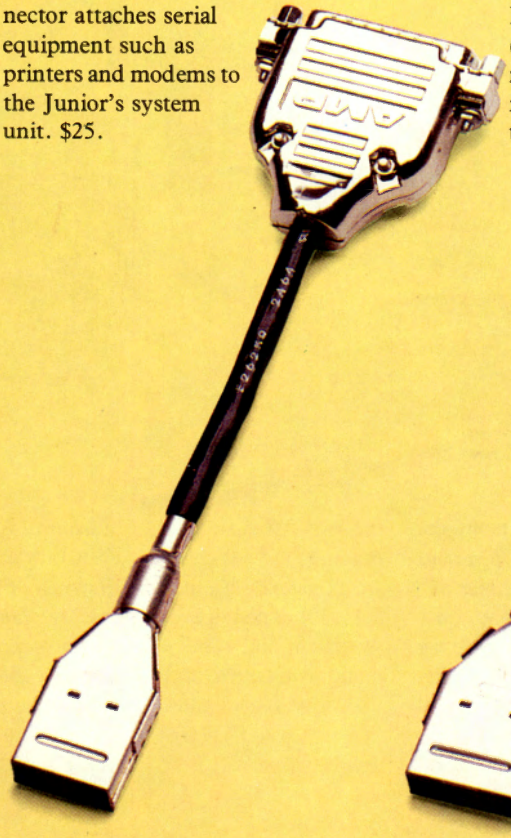


PC*jr* books and manuals. The *Guide to Operations* ($21.25) and *Hands-on BASIC for the IBM PCjr* ($17.50) explain setting up the PC*jr* and writing simple programs. Every owner of a PC*jr* with a disk drive should have the DOS 2.1 disk and manual ($65). The *BASIC Reference Manual* ($11.25) explains every statement and command in Cassette and Cartridge BASIC. *BASIC Programming Development System* ($130), *DOS Technical Reference* ($30), *PCjr Technical Reference Manual* ($35), and the *Hardware, Maintenance and Service Manual* ($88) are for users who want to poke around "under the hood" of the Junior.

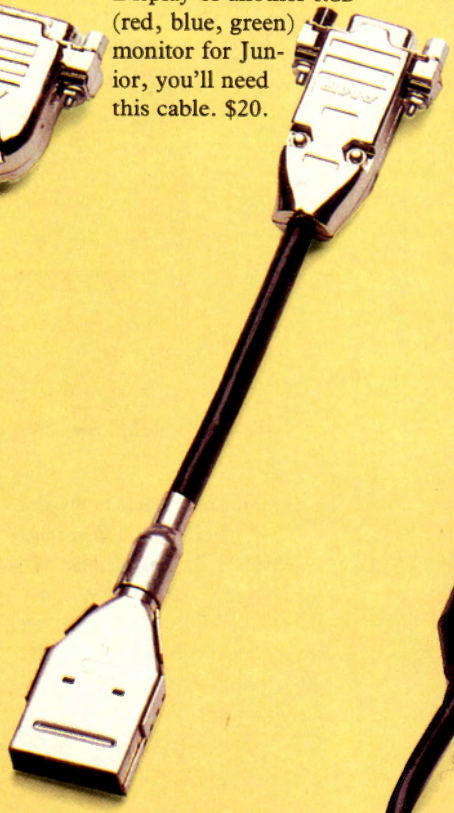
Internal modem. This device gives Junior the ability to communicate with other microcomputers and electronic information services. It plugs into a special slot on Junior's main circuit board. Besides this feature, it's like most other modems. It connects directly into a telephone wall jack; it operates at baud rates of 110 or 300; and it has its own dialing unit that allows it to place and receive phone calls automatically. Modems not manufactured by IBM will work with Junior, but they must be connected through the serial port. $199.



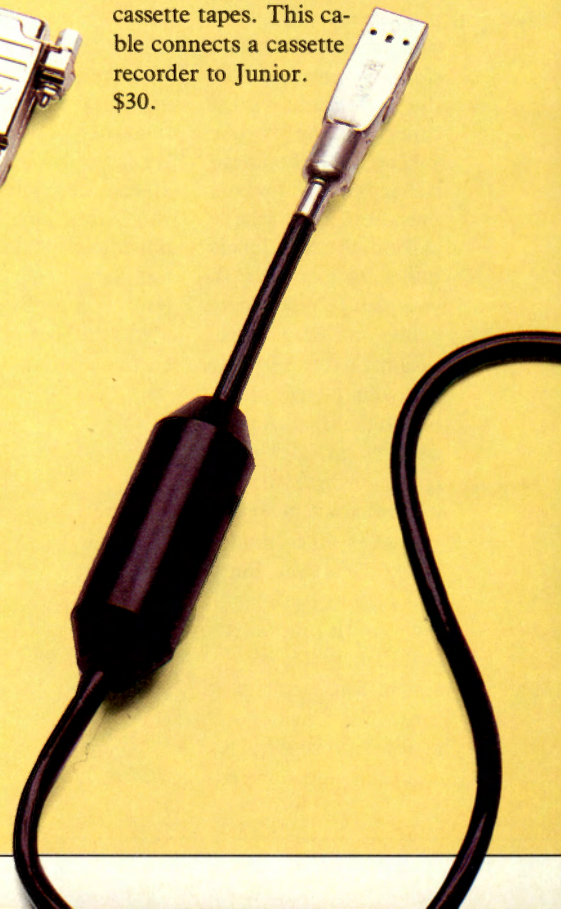
Adapter cable for serial devices. This standard RS232 connector attaches serial equipment such as printers and modems to the Junior's system unit. $25.

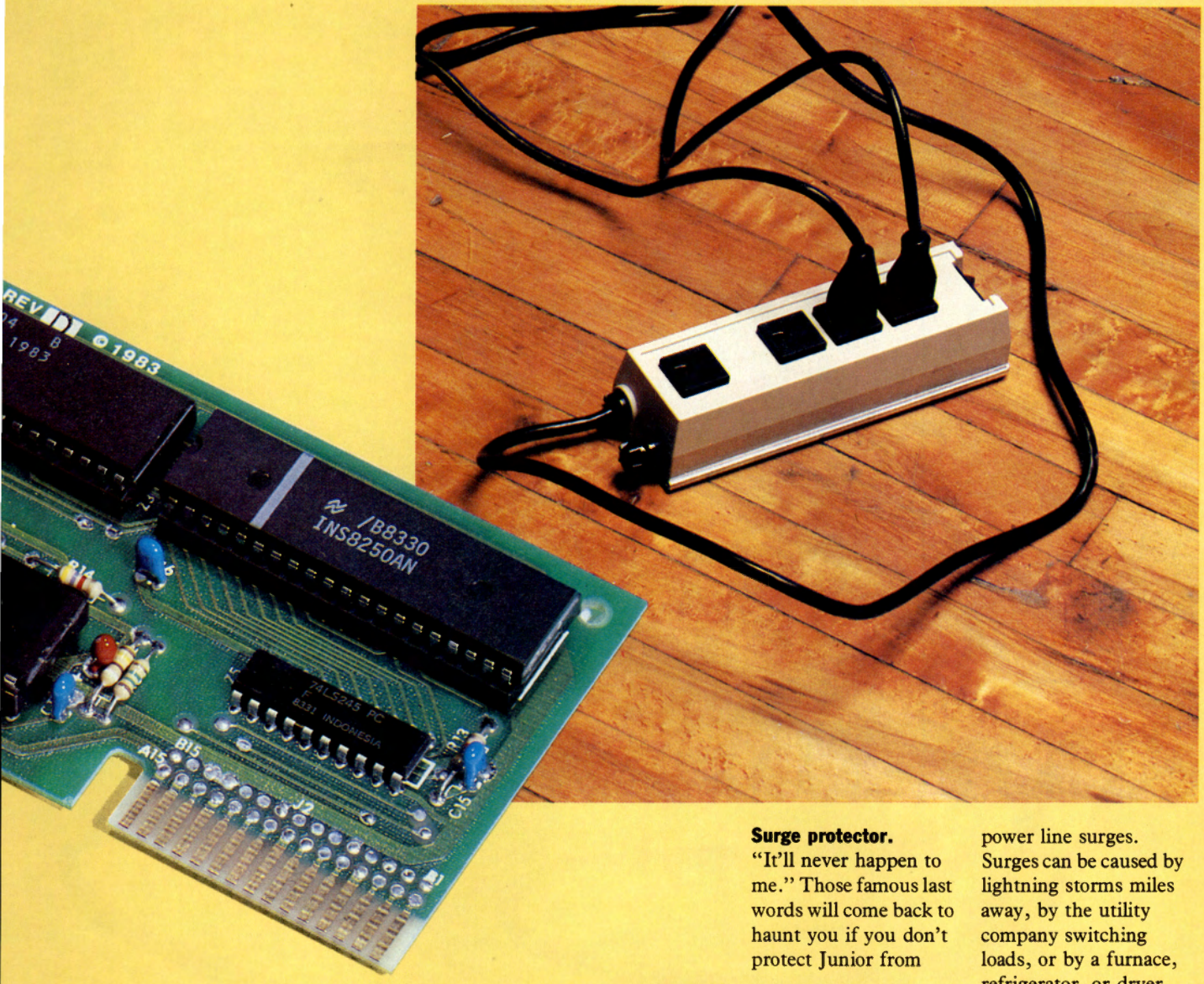


Adapter cable for color monitor. If you choose the IBM Color Display or another RGB (red, blue, green) monitor for Junior, you'll need this cable. $20.



Adapter cable for cassette. An entry model PC*jr* can store programs and data only on cassette tapes. This cable connects a cassette recorder to Junior. $30.





Surge protector. "It'll never happen to me." Those famous last words will come back to haunt you if you don't protect Junior from power line surges. Surges can be caused by lightning storms miles away, by the utility company switching loads, or by a furnace, refrigerator, or dryer clicking on. They can rearrange programs and wipe out information. The protector pictured here is about $70.

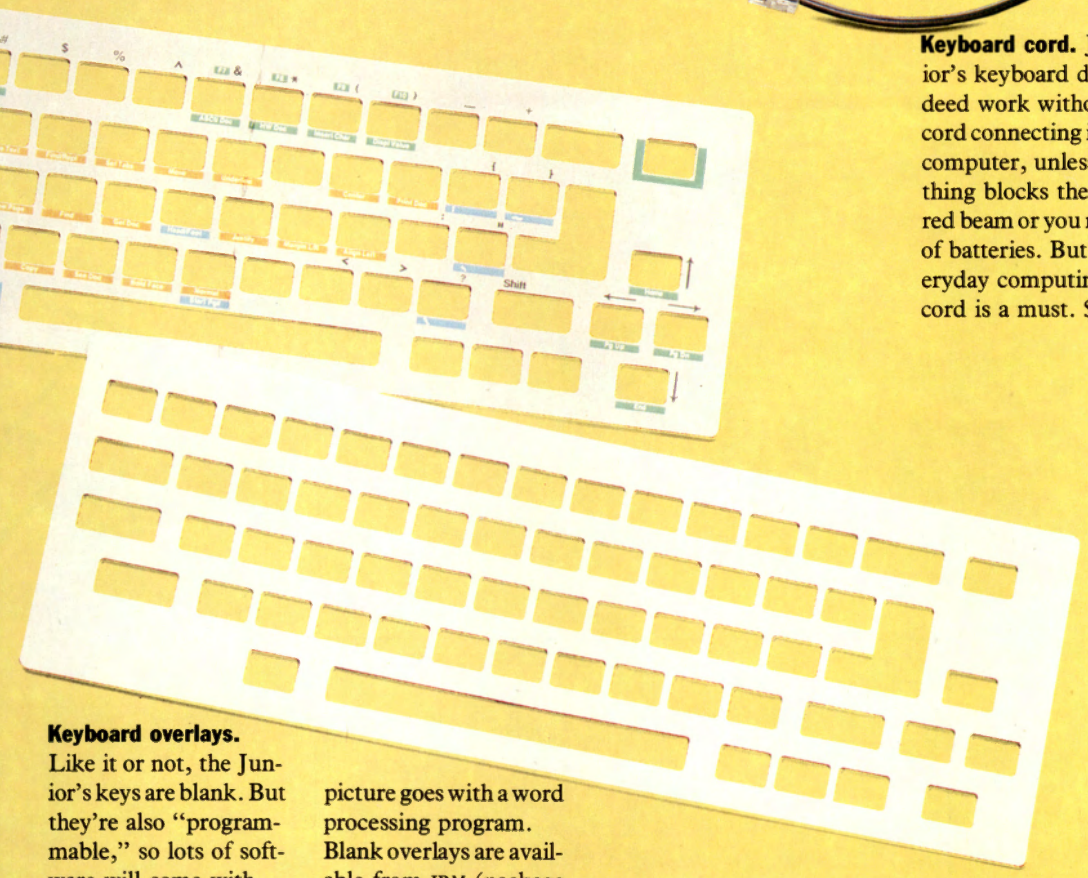


TV connector. If you use a TV for Junior's display screen, you'll need this connector to make the transition from sitcoms to spreadsheets. It attaches easily to the VHF antenna terminals on the TV and plugs right into the PC*jr*. $30.

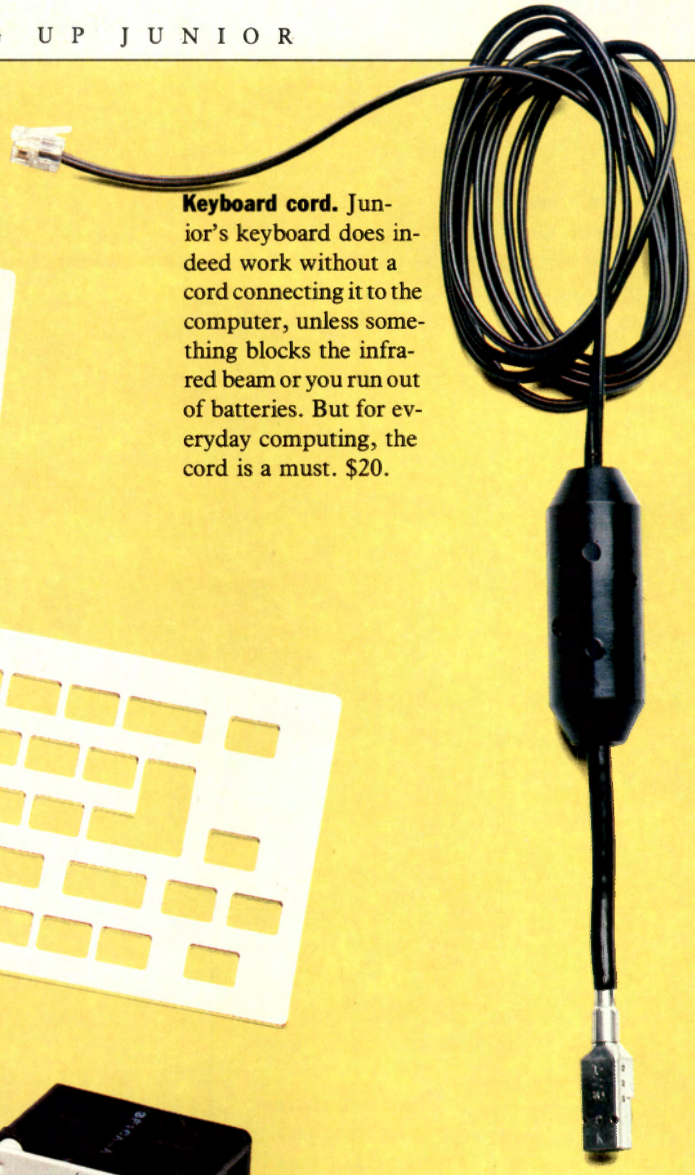




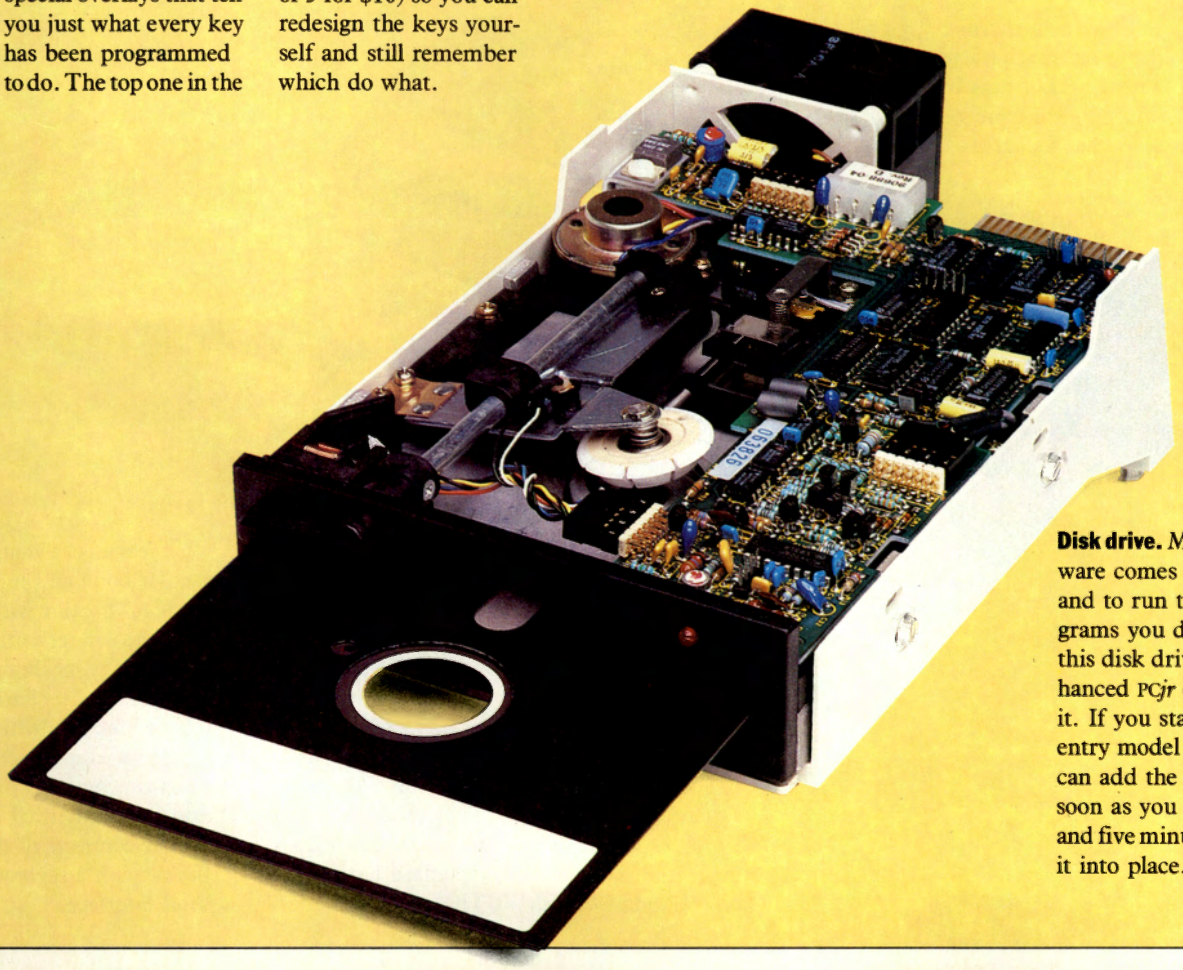
Joystick. Just what kind of joy will a joystick bring you? It will make playing games and running graphic design software on Junior a lot more fun and efficient. Most games will work without a joystick, but it's just plain confusing to remember which keys move the players up and down. If you have kids or there is a little "kid" left in you, spring for a joystick. IBM's costs $40.



Keyboard overlays. Like it or not, the Junior's keys are blank. But they're also "programmable," so lots of software will come with special overlays that tell you just what every key has been programmed to do. The top one in the picture goes with a word processing program. Blank overlays are available from IBM (package of 5 for $10) so you can redesign the keys yourself and still remember which do what.

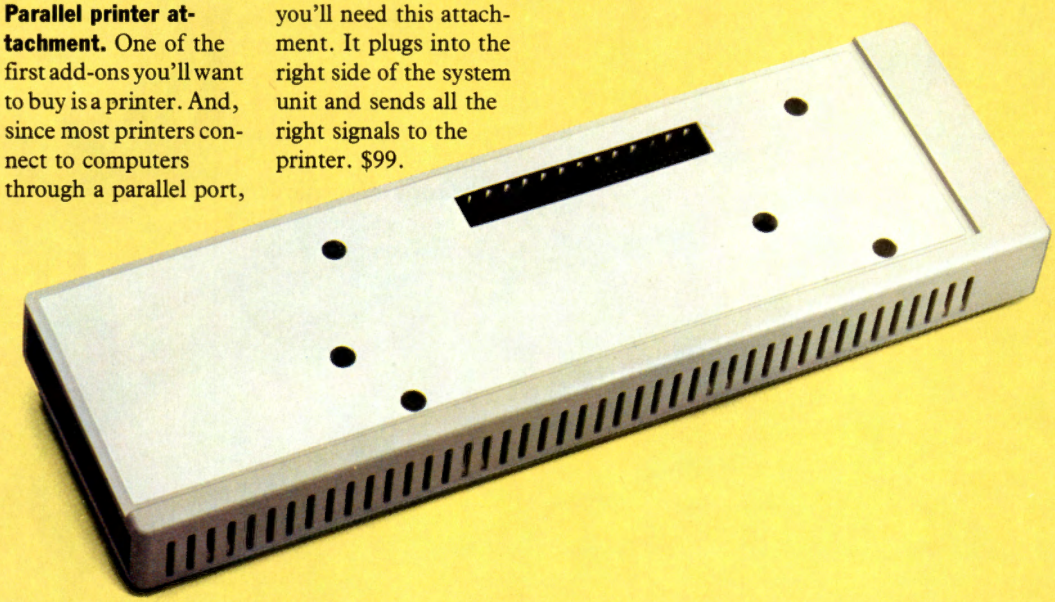


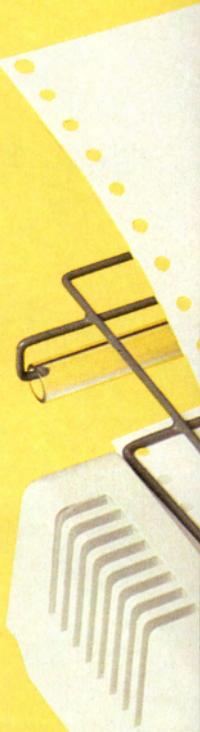
Keyboard cord. Junior's keyboard does indeed work without a cord connecting it to the computer, unless something blocks the infrared beam or you run out of batteries. But for everyday computing, the cord is a must. $20.



Disk drive. Most PC*jr* software comes on disks and to run these programs you depend on this disk drive. The enhanced PC*jr* comes with it. If you start with an entry model Junior you can add the drive as soon as you have $480 and five minutes to snap it into place.

Parallel printer attachment. One of the first add-ons you'll want to buy is a printer. And, since most printers connect to computers through a parallel port, you'll need this attachment. It plugs into the right side of the system unit and sends all the right signals to the printer. $99.





The compact thermal printer forms characters with a grid of dots by "burning" the image onto heat-sensitive paper.



Compact printer. This thermal printer is lightweight (6.6 pounds), small (12.3 inches wide, 8.8 inches deep, and 3.5 inches high), inexpensive ($175), and relatively quiet. It prints on sheets of specially treated paper up to 8.5 inches wide (standard letter size). This paper is more expensive than regular bond and it tends to discolor with age. The printer's other drawback is its slow speed (25 to 50 characters per second, which means an average letter takes two minutes to print). The thermal printer connects to the Junior with a separate *serial* interface.



and brothers in exi
custom made this life
than that of painted por
feel we not the penalty of Ad
me seasons' difference, as the id
fang and churlish chiding of the
winter's wind, which when it bites
and blows upon my body, even 'til
shrink with cold. I smile and say,
"This is no flattery, these are co
sellors that feelingly persuade me
what I am." Sweet are the uses of
adversity which, like the toad, we
yet a precious jewel in its head.
this our life exempt from public
haunt finds tongues in trees, book
in the running brooks, sermons in
stones, and good in everything.

Dot matrix printer. Dot matrix printers are faster than thermals, and they usually produce more readable text. The best dot matrix printers produce copy that is very near "letter quality," although still not suitable for business letters, resumes, and other formal correspondence. They print text and graphics on any kind of paper, but they make a lot of noise in the process. The dot matrix printer pictured above costs $595.

Dot matrix printers form text and graphics as patterns of tiny dots. The clarity of the characters is determined by how close together the dots are spaced.

What should you look for in personal

Before you go looking for personal computer software, you should know what personal computer software looks like.

(You're not alone if you don't already know that software programs come in a package.)

Programs are "pre-recorded" on cartridges, tapes or diskettes. And, although you can't tell by looking at these cartridges, tapes or diskettes, the programs on them can be very different.

What you put in is what you get out.

What happens when you play a high-quality tape on a high-quality recorder? Superior sound.

This analogy can also hold true with software. The better the program quality, the better the result —be it improved productivity or creativity.

IBM Personal Computer Software is both tested and approved by IBM. And these programs are designed to take advantage of an IBM personal computer's many advanced hardware features.

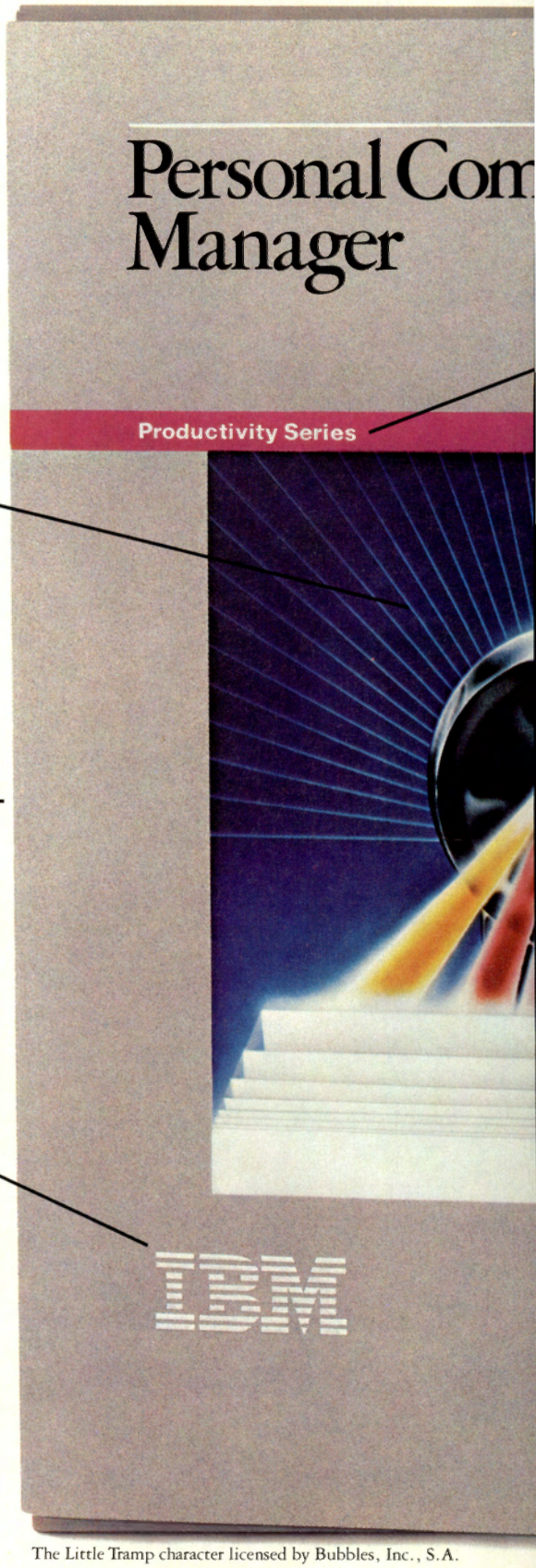
What the value is.

What are improved math skills worth? More efficient inventory control? Faster communications? What is accomplishment worth?

Any way you look at it, the value of personal computer software is the value of doing your best.

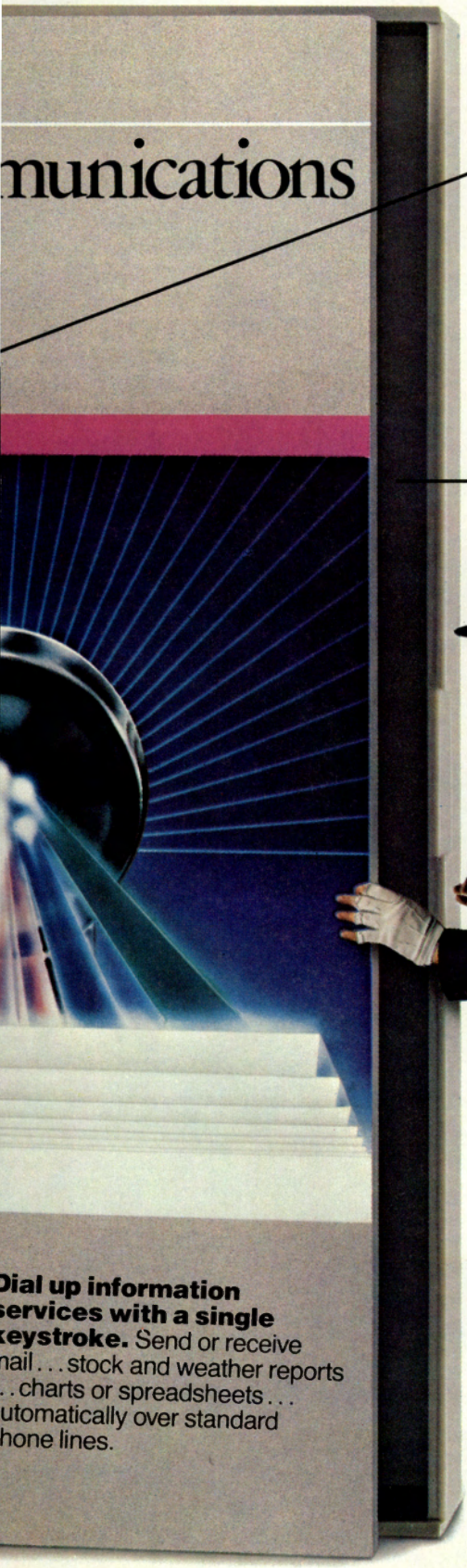
What compatibility means.

Many of the same software programs that run on the IBM Personal Computer you use at work will run on other IBM personal computers you use in other places. So you can, for example, continue in your family room what you started in the classroom or boardroom. (Or the other way around.)



The Little Tramp character licensed by Bubbles, Inc., S.A.

computer software?



What's available.

One software program can't satisfy everyone's computing needs. That's why IBM has such an extensive library of programs. You'll find a series for productivity, education, business, entertainment, lifestyle, programming or communications.

With IBM Personal Computer Software, you have a choice.

In word processing, for example, you may want a simple program for memo writing. You'll find that program in the IBM software library. If you want a sophisticated program for report writing, you'll find that in the library as well.

What's inside.

Sometimes learning a program is easy. Sometimes it's not. That's why inside every IBM software package are instructions that are clear and understandable.

What you can do right now.

There's more to look for in personal computer software than what you've read here. To find out more, look no further than your authorized IBM Personal Computer dealer. For one near you, call 800-447-4700. In Alaska or Hawaii, 800-447-0890.

IBM®

Personal Computer Software

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When we asked Junior where he got his educational software, he said "BPTHGLL!"

So we told him about Vanpak, the PC, XT, PCjr Software Center with the largest, most complete library of software available from one source. Junior was thrilled, because now his mom and dad and brothers and sisters could take him to a Vanpak dealer and get lots of educational software. All Junior really cared about was another ride in the car, but the rest of the family was excited about more educational programs. Over 300 PCjr programs to choose from! Now when we ask Junior where he got his software, he says "Vanpak!" For information on a Vanpak dealer in your area, call 1-800-328-7847 today.

Software Strategies™ inc.

7416 Washington Avenue South
Eden Prairie, Minnesota 55344
1-800-328-7847

A partial listing of available programs: Language Skills - $29.95; Vocabulary Development - $29.95; Solving Word Problems 2 - $29.95; Solving Word Problems 1 - $29.95; Nouns - $29.95; Verbs and Adverbs - $29.95; Adjectives - $29.95; Prepositions and Conjunctions - $29.95; Verb Tenses - $29.95; Word Choice - $29.95; Phrases and Clauses - $29.95; Possessive Case - $29.95; Punctuation & Capitalization - $29.95; Records Language Arts Series - $29.95; Pronouns - $29.95; The Author - $195.00; Personal Computer Tutor - $59.00; Letter Man - $34.95; Geography Quiz - $39.00; Typing Strategy - $34.95; Letter Man - $34.95; The Law - $29.95; Decision Making - $29.95; Succeeding - $29.95; Self Concept and Your Work - $29.95; New On The Job - $29.95; Friends and You - $29.95; The Age of Responsibility - $29.95; Credit - $29.95; The Job and You - $29.95; Consumer Fraud - $29.95; Tips On Buying A Used Car - $29.95; You And Insurance - $29.95; Law For Consumers - $29.95; Part-Time Jobs - $29.95; Map Reading - $29.95; Money - $29.95; Bar and Picture Graphs - $29.95; Pie and Line Graphs - $29.95; Understanding Chkbks - Statements - $29.95; Real Cost - $29.95; Diagnostic Disk 2 (705-709) - $29.95; Diagnostic Disk 1 (700-704) - $29.95; Basic Skills - $29.95; Startrek - $24.95; Football - $29.00; School Executive - $499.00; Math Drills - $39.00; Math Wizard™ - $19.95; Personal Math - $29.95; Math For All Ages - $29.95; All About Interest - $29.95; Metrics And You - $29.95; Fractions Percents and Decimals - $29.95; Businessmaster; Handbook II - $2100.00; Taxcomp™ - $100.00.

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The Software Story

Slightly larger than a Star Wars lunch box, PC*jr* exudes a chic sparkle and boldly flaunts the IBM logo. But what will it do for you once you get it home and out of the box? That depends, of course, on its software possibilities. Each program promises to, and often does, teach you something you didn't already know, solve financial equations great and small, or record ideas too tedious to jot down and edit by means of pencil and eraser.

To assist you in exploring the software hunting grounds, let's first talk about compatibility. Most of the programs written for the IBM PC use 64K of RAM and one disk drive, and so will run on the enhanced PC*jr*. It's been estimated that over 90 percent of PC software will do this. Naturally, there are exceptions.

Any programs that need more than 128K and/or a second disk drive or hard disk won't run. That rules out the use of many of the memory hungry integrated packages and sophisticated spreadsheets. But the 8088 chip (the heart and mind of the PC*jr*) can read and write to about 640K of RAM, the Junior's design allows for connection to a second disk drive, and the DOS contains hard disk access commands. It seems likely that memory boards raising Junior to a full 640K, and a second disk drive will soon be available.

Besides goodness-of-fit within available memory and disk drive, there's another constraint—if

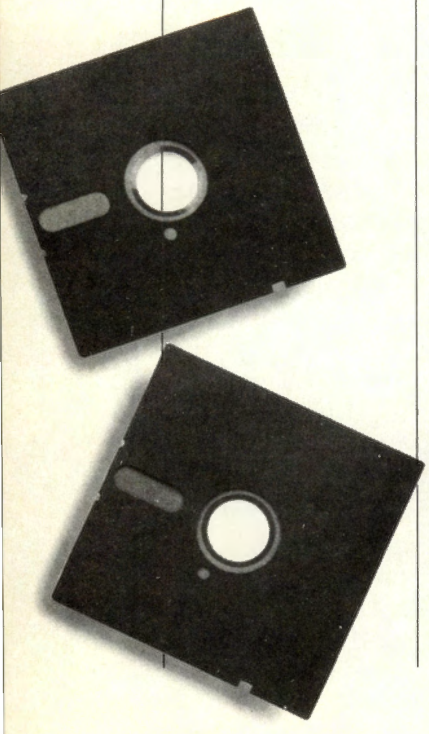
PHOTO BY MARIAN GOLDMAN

a program relies on Direct Memory Access (DMA), it won't run on the Junior. Whether or not that program was designed with DMA on board isn't the kind of information you'll find on the side panel of the package. To be safe, look for the product blurb proclaiming that it will indeed whoop, holler, and shout, once plugged into PC*jr*'s magic crystals.

It goes without saying, of course, that much software is being developed especially for PC*jr*. With great graphics, color, and sound capabilities, it lends itself to new and exciting, yet practical, programs. Watch for news of the latest in software in future issues of PEANUT.

One of the most important considerations to make before shopping is to plot the variety of things you envision your computer doing for you. Brainstorm all the possibilities, no matter how mundane or outrageous they may seem. Then, armed with a wish list, hit the stores. The odds are good that a program exists for your needs. Let's look at some of the categories of programs you might be interested in, and discuss how you might use one of the selections.

Not all educational software is for kids—far from it.



EDUCATIONAL SOFTWARE

If you're a parent, you've no doubt felt the pressure of buying a computer for your kids. Many parents are afraid that without one, their offspring will fall behind the other kids on the block. Will a home computer improve grades? The answer is yes, and no. Computer Assisted Instruction (CAI) is a respectable remedial and supplemental aid. If a student is behind in a subject, an hour or two a night with an appropriate educational software package can help. A computer won't magically transform average kids into talented and gifted ones. But they will gain a better education by doing some homework on a computer, especially as more sophisticated programs become available to illustrate and then solve the secrets of biology, mathematics, and reading. And there's a hidden reward: parents who might be a little hesitant to sit down with their kids and discuss math problems out of a book seem better able to sit down with them in front of a home computer. It's in this kind of situation that a child's intellect will really thrive.

But not all educational software is for kids—far from it. Maybe you have a yen to learn a new language, update sales skills, explore history. You can find the educational software to do it. Software publishers produce educational programs in the following forms:

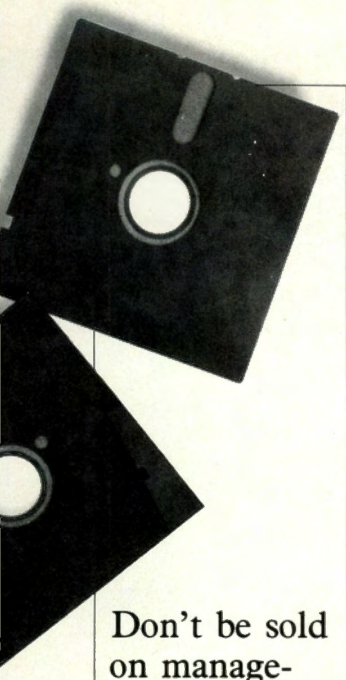
Tutorials: Usually in a straightforward, self-directed lecture form, software tutors are available in most academic subjects. You can teach yourself to type, learn new vocabulary, or get help in using a complicated database program.

Discovery games: These educational programs look like fun—usually are—and pack instructional objectives into game formats.

Simulation programs: Here the student takes on the characteristics, for example, of a sales person or a detective. For instance, he or she tackles a "real-life" sales problem or murder mystery and develops new skills along the way. Through simulations, you can set up the chemistry lab you missed in high school or take a trip with Lewis and Clark as they explore the West.

Drill programs: Like the name implies, drills reinforce what you've learned through repetition. Most give an occasional gold star.

Are you buying for a child? Ask his or her teacher for specific suggestions and reviews of the software that can be found in most school's instructional media centers. If you're buying for yourself, it doesn't hurt to ask the school's lead computer teacher or other knowledgeable staff member. Instruction, after all, is the business of schools and chances are that someone there can brief you on the strengths and weaknesses of all sorts of programs, from learning to count to conversational French.



Don't be sold on management software you don't really need.

There are literally hundreds of educational software programs, some so extraordinary they can enrich kids' lives or deliver a big learning boost to those who may need it. Others are humdrum, and won't hold their appeal for more than a minute. It's a good rule of thumb to try all educational software *before* you buy. If you're looking to improve your typing skills but don't care to make a game of every stroke you tap, find out before you plunk down your $50. If it's "how to" you're seeking, don't buy a "what if" package.

GAMES

Ever watch children and adults at a video arcade pouring a fortune's worth of quarters into games of intergalactic conquest? Besides passing time, they are building hand-eye coordination, computer literacy, and a new way of thinking, seeing, and communicating with the world. Because of its great graphics ability, the PC*jr* is a star when it comes to games. Even if you're not a games fan, take a look at some. They too can be classified into categories.

Adventure games: In the library of computer games, these are the novels. *Adventure* and *Adventure in Serenia*, programs in the initial library of PC*jr* software, are bound to mesmerize you. Once you are hooked, you won't emerge from their fantasy and role-playing for hours.

Shoot 'em up games: These kill you off more quickly. With names like *Bomber Attack*, *Crossfire*, and *Space Invaders*, they're usually short on plot but long on action.

Electronic card and board games: The computerized versions of chess, backgammon, and bridge usually let you determine for yourself how fast or slow you get beaten. You can test your skills against a partner who never wants to watch TV instead, programming it as an equal—or one that leaves you ever humble.

Sports games: Giving new meaning to the sedentary life, sports games let you root for the home team and *be* the home team—at the same time.

Simulation games: Before simulation games, only astronauts could land a lunar module. Not only can simulation games imitate a grand tour of the Milky Way, they are therapeutic as well. If you've been having nightmares ever since the Superbowl, try acting out your frustration as "Monday morning quarterback."

HOME APPLICATIONS

A very real problem associated with computerizing your life is that the everyday tasks—those that don't normally rate much thought—can become very complicated. One of the worst offenders is a checkbook balancing program. Typically, a checkbook balancer will record daily balances, to whom each check goes, its number, and dollar amount. Ironically, figuring the whole business in your head and jotting it down with a pencil takes about one fifth the time than plugging it into the computer, so why bother? In some cases, it's best to stick with traditional methods.

The same fundamental malaise also haunts shopping lists and chore charts. This is not an indictment against home applications. However, it is a plea that before purchasing any home management tool, you consider whether it really will make life easier and more organized.

Some applications are very worthwhile and can usually be lumped into the very respectable realm of record keeping—for example, a daily expense diary for income tax purposes. Even something as simple as a family's medical record keeper can be useful. Certainly one of the most valuable contenders is a cash flow manager, the kind that keeps track of all the different income sources and expenses.

But don't be sold on management software you don't really need. A lot of programs that fall into the category of "productivity" software will actually slow you down or frustrate you to the point that you ignore the very task you're trying to do better. It doesn't do any good to yank recipes wholesale out of a favorite culinary magazine with the intent to



To predict investment possibilities, you'll need a spreadsheet program.

catalog them "someday." You'll soon have a stack taller and wider than the Statue of Liberty. But if you enjoy the discipline of organizing and logging them in a recipe filing program, you may become the next editor of *Gourmet* magazine.

While you should, to an extent, be wary of "productivity software," if you think you might benefit from an automotive repair program, look at it in action. And if you must know whether the moon is in its seventh house in order to get out of bed in the morning, a horoscope package may be just what you're seeking.

WORD PROCESSING

With word processing software, you can retire your typewriter and enjoy painless spelling corrections as well as the electronic cut and paste of rewritten paragraphs and pages. These word handlers are fairly easy to learn and once you're armed with this know-how, the craft of processing words becomes second nature. But beware: the package you find easiest to use in the store may not be the simplest to use later on. Think about your specific needs and compare programs before you buy.

BUSINESS SOFTWARE

Here again be choosy. If you want to predict investment possibilities, you'll need a spreadsheet program. Spreadsheets are a tool for automatically showing "what if." Your business may be on target for today, but what will happen to your cash flow if inflation runs ten percent? Or, what if sales climb, or plunge, by 50 percent? A spreadsheet program will update all your figures when any one of these variables is logged in. Before buying, see a few different programs and compare the way they display information.

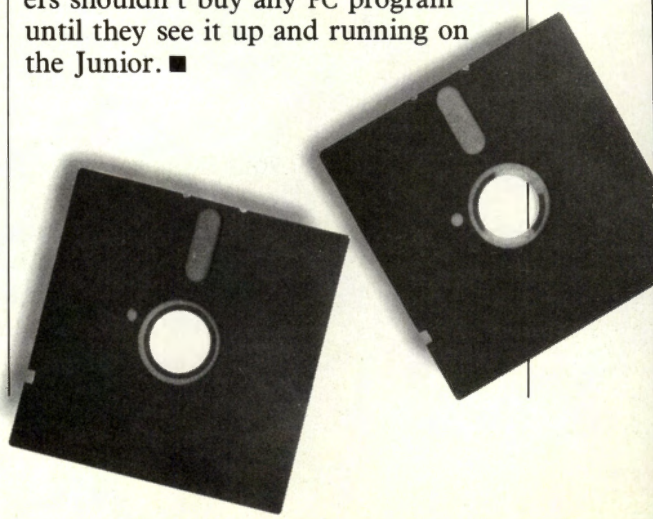
For mailing lists and other databases, you'll need specific software to file and sort this information. Computerized filing systems provide a way to easily manage reports, letters, research data, names and addresses. The really powerful database managers also make provisions so you can mix and match different categories of information. For instance, you can search the records to see who paid all of their bills on time. You can even narrow it down to who paid all of their bills on time *and* lived within a particular zip code. At home, you can recall, out of the dozens of Christmas cards you sent, those who replied with their own holiday greetings.

PROGRAM UTILITIES

Program utilities are the shakers and movers. They are software that lets you modify and add to your computer's usefulness. The BASIC compiler, for instance, converts a program you've written in BASIC to the PC*jr*'s native tongue, machine language. With that translation, the programs run many times faster. *The Personal Editor* program aids in the writing and modifying of BASIC programs.

With a terminal emulator program, you can dial up computer networks that specialize in home banking, electronic mail, information research, or the sharing of public domain software. The program routes the information you type at the keyboard to a modem (which you'll need to purchase) which sends it over the phone lines.

IBM and scores of software publishing companies are creating new programs and repackaging original PC programs for the Junior. While it's true that many programs written for the PC will run on the Peanut without changes, PC*jr* owners shouldn't buy any PC program until they see it up and running on the Junior. ■



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*Ranked # 2 on the Home Education BESTSELLER List for February 1984 issue of Software Merchandising.



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COMPUTER PREPARATION for the SAT combines the power of a comprehensive review textbook with the excitement of interactive computer software to help students score high on the SAT. Personalized study plans, extensive explanations, instant scoring and challenging drills motivate students to study longer and learn more in a shorter time. With HBJ's COMPUTER PREPARATION for the SAT studying becomes FUN.

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How to Grill Your Dealer

If the person trying to sell you a PC*jr* tells you that the upgradeable capabilities of this 8088-based machine can gateway you into a variety of vertical market applications, *don't* be alarmed. People "gatewayed" come back. But *do* ask yourself a question. Should I buy a computer from someone who doesn't seem to speak my language?

Finding the right dealer is the second step in finding the perfect computer fit for you and your family. And this question-packed feature is designed to help you find one you can live with long after you write the check. The first step is to know why you want a computer in the first place.

Do you want a PC*jr* for educational reasons? Or do you want it to play games? Would you like to run personal management or productivity programs? Are you interested in the PC*jr* as an extension of your office computer? "Tell us why you're buying this machine," says Matt Fitzsimmons, vice president of ComputerLand in White Plains, New York. "Then we have the basis for doing business."

If you're not sure why you want a computer, hold off on visiting your dealer. "Start at the library first or the bookstore," says Paul Klemond, from Dayton's Computer Center in Brooklyn Center, Minnesota. He advises you talk with people who have them, find out what they do, and explore software availability. Is there any particular software application or activity that appeals to you? If not, you're probably not sure what you'd like your computer to do and should, for the time being, hold on to your hard-earned money. (*The Software Story, page 37, is a good place to start.*)

If you want to play the game, you've got to learn the language.

Next, realize that if you want to grill your dealer, you'll need to know at least some computer terminology. While you need not be fluent in "technotalk," you'll be a better shopper if you know RAM from ROM. The buzzwords at the right will help you build a basic vocabulary. One note of caution: Don't fall into the trap of using jargon when you don't know what it means. "The dealer will assume too much and start talking over your head," explains Steve Daniel, a salesperson at the Computer Connection in Silverdale, Washington. When he suspects people are bluffing, Daniel's colleague, Bob Noyes, gives them a test. "I'll say something about the RAM on the diskette. If they say, 'Oh, yeah,' then I know that they don't know what they're talking about."

Once you know your CRT from your CPU and you've decided on a few things you want to do with a PC*jr*, you're ready to take your questions on the road. Since software is the key to the Junior's usefulness to you, let's start there.

Is there a salesperson who specializes in the software I'm interested in? A former teacher, for example, will be better equipped to discuss educational software than someone who doesn't know about instruction. A store specializing primarily in business soft-

THE TOWER OF TECHNOBABBLE (SIMPLIFIED)



Address. A specific place in the computer's memory where any piece of information is stored.

Applications software. A program that accomplishes one task, such as balancing a budget or teaching a skill.

Baud rate. The speed at which electronic information travels through a line from one device to another.

Bit and byte. A bit is the shortest piece of information a computer uses. A byte is made up of 8 bits of information and makes up one character—either a number or a letter. A microcomputer's memory is measured in how many bytes of information (how many numbers and letters) it will hold.

Board. A circuit board or card that usually fits into one of a computer's expansion slots and adds to the computer's capabilities—more memory, better display, etc.

Boot. To start a computer system by loading a program into the computer's memory.

CPU (central processing unit). The computer's "brain," which controls all its operations.

CRT (cathode ray tube). The computer's picture screen.

Disk. A round piece of magnetic tape for storing information and programs. PC*jr* uses floppy disks, or diskettes. Some computers use hard disks, which store more information and are more expensive than floppies.

Disk drive. A device that takes information from a disk and transfers it to the computer's memory.

Disk operating system (DOS). A program that controls the transfer of information from disk drive to computer.

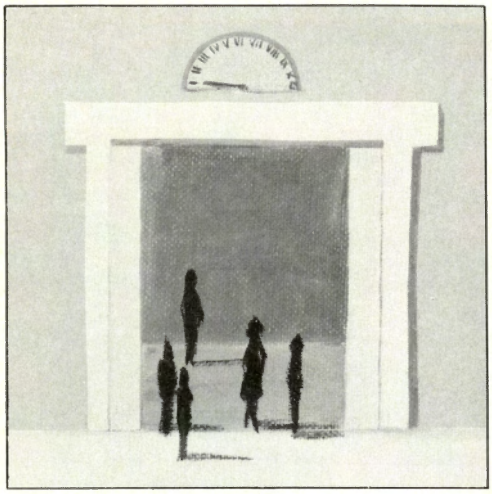
Download. To transfer information or programs from one computer to another.

Duplex and half-duplex. Modems both send and receive information over the phone lines. A duplex modem can do both simultaneously; a half-duplex only does one at a time.

File. A collection of related information.

Hardware. The electrical and mechanical equipment in a computer system. Includes the keyboard, the system unit, monitor, printer, modem, and so on.

LAUREL DAUNIS



ware may be entirely the wrong place to seek information about games. Look for salespeople who know their stuff.

Can I try before I buy? Since many stores don't allow you to return software, you should see a program up and running in the store *before* you buy. Don't be satisfied with just the loading process and the menu display. If that's not available, ask for the name of someone who has used the program before as a reference.

Some dealers will let you return software. For example, the BASIC Computer Shop, an Ohio-based chain of eight stores, allows cash returns up to seven days after you buy, and will give credit for up to 30 days from purchase. The Entre Computer Center in Westfield, New Jersey, allows returns "given that it's within a reasonable period of time," explains owner John Howlett. But a number of stores will only accept software back if you haven't opened it yet. And often, as is the case at ComputerLand of downtown Baltimore, there is a restocking fee of 20-50 percent of the original price. Ask about your dealer's return policy. If there is none, make sure that you know what you're buying.

What if my software is defective? Some dealers ask that you bring problem software to the attention of the manufacturer, but most stores prefer that you return it to them for replacement. In any case, check the general reputation of the software manufacturer you're supporting—how will they support you in return? Read the fine print. Some disclaim all responsibility. However, most software companies will replace a defective disk—with proof of purchase—for a defined warranty period, usually 30 or 90 days. After this time frame is up, the company might sell you a replacement disk for about $5 to $10. But as Al Rossi, customer service manager with Datasoft, a manufacturer of games and word processing programs, says, the problem must be with the software itself. " 'My baby sister sat on it with a wet diaper' doesn't warrant a replacement," Rossi notes.

How do I get a back-up copy of a disk? Some software manufacturers provide you with a back-up disk as part of the original package. Some provide you with directions to make one copy. Others will send you one if you mail them a specified amount—usually $10-$12.

Do I need a disk drive? If the software you've selected runs in disk form, you'll need a disk drive. If its memory requirement is over 64K, you'll need the 128K of the enhanced PC*jr* model, as well. On the other hand, if your software is on cassette, you'll probably want the less-expensive entry level Peanut, but you'll need to add a cassette player and a special cable to connect it to Junior. The basic PC*jr* comes with slots for cartridges, but at the moment there are very few programs available on cartridges.

Will I need a joystick? Or two? Most games require joysticks. Some games can be played without them, but usually you will be a better player if you have one. Say you're playing a game called "Gunslinger Harry." If Harry only moves his horse when you push keys on the right side of the keyboard and only fires when you push keys on the left, you'll have problems looking down at the different keys and up at Harry on the screen all at the same time. Chances are Harry will get buried with his boots on—and so will you.

If most of your game-playing pits you against the computer, then one joystick is enough. If you buy software games for two players, then buy two joysticks.

Interactive. Describes a program that allows the user to influence its operation while it is running. For example, a program that asks the user questions and then proceeds according to the answers it receives.

Interface. A device that connects a computer to add-on equipment such as printers and modems.

I/O (input/output). The act of getting information into and out of a computer.

Menu. A list of options in a program that appears on the screen. Programs called *menu-driven* give the user all the information about running the program on a menu.

Microcomputer (or micro). A small computer with its central processing unit on a chip. PC*jr* is a micro.

Network. Two or more computers that can share—send and receive—data with each other.

On-line. A computer and its user are on-line when the system is ready for use. Also refers to a computer connected to a network of computers.

Parallel. Refers to a special way of sending electronic signals. Devices that send and receive parallel signals (many printers do) must have a special cable to connect them to a computer.

Should I purchase a monitor, or will a TV work just as well? Again, consider the software you'll be using. For word processing and some business programs, a *monochrome monitor* (other than IBM's, which isn't compatible with the Junior) will be easier on the eyes. But if you will be using educational and game software, you'll want to consider a color monitor. A good color monitor has higher resolution than a TV (meaning it squeezes more dots of light into the same area), so the designs you create or the graphics a program displays will have more intense colors and a sharper image. If your dealer has a TV in the store, compare the two before purchasing.

If your needs include both word processing and games, consider a high quality color monitor with RGB video signals (or individual "shot-guns" for red, green, and blue.) Most composite video screens (where all three colors are shot out from the same source) are hard to look at when you're viewing a lot of words and numbers. Ask your dealer to demonstrate word processing on any color monitor you're considering before you purchase it.

Peripheral. Equipment that attaches to a computer, such as disk drives, printers, joysticks, and voice synthesizers.

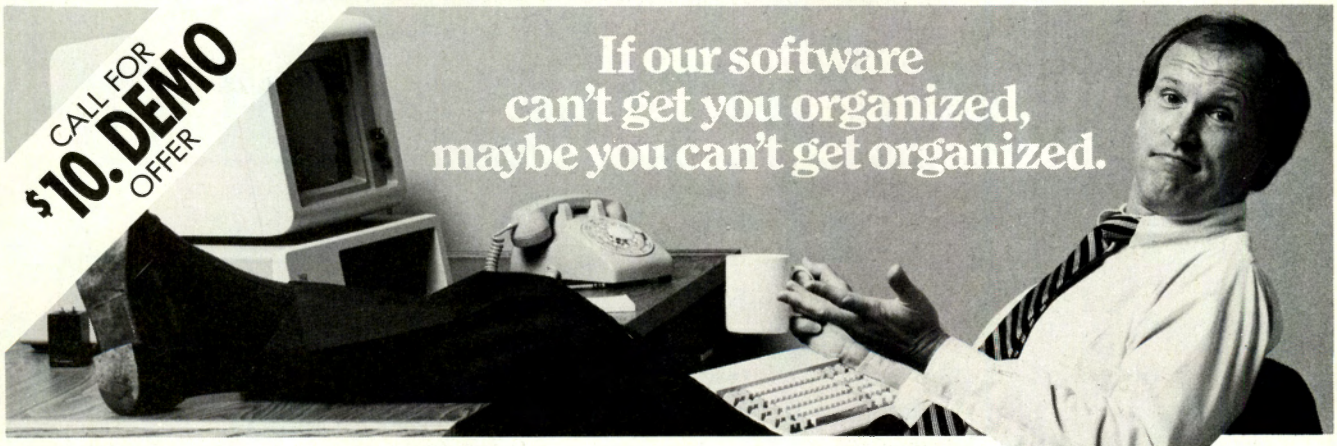
Pixels. Short for picture elements, they are tiny dots of light that make up the images on a screen.

Port. A place in the computer's memory where information is sent, usually to communicate with an outside device.

RAM (random access memory). The part of a computer's memory that you can read, or take data from, and write, or transfer data into. Data in RAM are erased whenever the computer is turned off. RAM is measured in kilobytes (K).

Do I need speakers? The PC*jr* comes with only a one-tone beeper, but it has the capacity to generate music. Many new games and educational programs take advantage of Junior's power of sound and if you plan to use such software you'll need speakers to hear the music. If you use a TV set instead of a monitor, you won't need to worry about external speakers; a television's speakers render full sound. However, most monitors have only one-voice speakers. If you plan to buy a monitor for the Junior, ask your dealer to demonstrate some external speakers for you.

What printers are available? How much do they cost? Printers are one of the first peripherals most home computer owners buy. If you use the Junior primarily for games, you probably won't need one. A few educational programs require a printout, but you probably can get along without one here as well. If you use your computer for word processing and have access to a printer



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at the office, you can write at home, and take the disks to work for print out there.

If you do decide you need a printer, your dealer will show you three kinds—thermal, dot matrix, and letter quality. They vary in price, noise level, quality of their printing, and the method they use to form characters.

With a **thermal** printer, an electric current darkens the image of characters on specially treated paper that reacts to heat. Also called electrostatic printers, they are usually the cheapest and the most quiet of the three types of printers, but their special paper is expensive, and the print quality is poor. Thermal images also tend to fade, but for around-the-house hard copy, a thermal printer is probably your best choice.

Dot matrix printers work by driving wire pins against an inked ribbon, forming characters that are a series of dots. Dot matrix printers are fast; they can churn out copy at a rate of 80-400 characters per second—about one page of text per minute. They are average in terms of price and noise.

Resolution. The sharpness of an image on a computer's screen. The higher the resolution (*high-res*), the sharper the image appears.

ROM (read-only memory). The part of a computer's memory for permanent storage of data. ROM contains the computer's operating instructions and cannot be changed.

Serial. Refers to a special way of sending electronic signals. Devices that send and receive serial signals (many modems do) must have a special cable to connect them to the computer.

When your hard copy must have the clean, professional look of a good electric typewriter, you'll have to pay for a **letter-quality** printer. The most expensive, they are also the slowest (25-80 characters per second) and the noisiest—although you can buy a cover to muffle the din. Thermal and dot matrix printers can generate graphs, tables, and pictures. Letter-quality printers, like typewriters, cannot.

Should I buy a modem? A modem allows you to communicate with other computer users and gives you access to large databases of information stored in electronic form. Ask your dealer to show you the different kinds. **Direct connect** modems plug directly into a phone jack. They give you the most reliable service and cost between $150 and $750. With an **acoustic coupled** modem, the handset (mouthpiece and receiver) rests in two cups. These modems run from $100-$200. Ask about **duplex modems** (which can send and receive at the same time) or the cheaper **half-duplex** (which can't send and receive simultaneously.)

Contribute to Peanut

There are several ways to get published in PEANUT. Manuscripts that you can submit without a proposal or query are news items and computer tips for *Peanut Gazette* and original programs for the *Peanut Post-It Program* page.

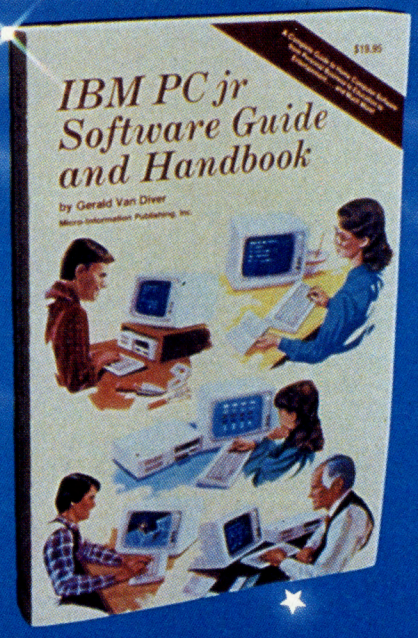
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What does the IBM warranty mean? IBM will be supplying your dealer with substitute parts for the Peanut: keyboard, system unit, motherboard, transformer, disk drive, and memory and display expansion board as well as add-on options. Anytime your Peanut has a problem during the first year you own it you simply take it in, and your dealer will replace its malfunctioning part with one that works (assuming you haven't brought on the problem yourself by trying, unsuccessfully, to modify the computer with non-IBM parts—or by misusing it in some way). Your dealer will then send any part he or she takes out of your Peanut to IBM where the broken piece will be thrown away or repaired and used again in another exchange of "field replaceable units."

Check with your dealer concerning how long the repairs should take, and ask him what will happen once the year is up. IBM will be offering some kind of extended warranty, with details to be released soon. Your dealer may have plans for his own PC*jr* service option, where you pay an annual rate and any required new parts and labor are provided at no additional cost.

Do you have loaner equipment? If one of your PC*jr*'s peripherals has a problem that can't be fixed right away, your dealer might arrange for you to borrow a substitute. This is most common for peripherals such as printers.

Will you service equipment I don't buy here? Some dealers will if they carry the particular item, especially if you're a regular customer.

Do you offer any computer instruction? More and more dealers include a short course (usually a few hours) at no extra cost. Whether or not your dealer offers formal classes, most will show you how to load, copy and format a disk before you leave the store. If they don't offer, ask.

How does your dealer measure up? Ask yourself three more questions before you write your check: "Am I satisfied with this dealer's answers? Does he or she speak my language? Will I get the service I need?" If not, take your money—and your dealer-grilling skills—elsewhere.■

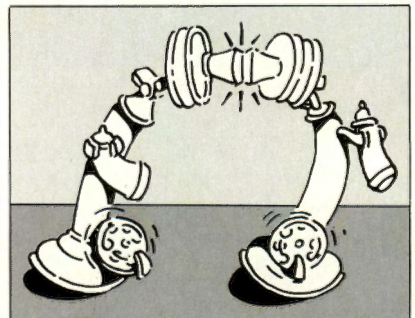
Software. Computer programs and the disks, tapes, or cartridges they come on.

Telecommunications. Transmission of data over distances by electronic means, usually over the phone lines.

User-friendly. An overused term that implies that a program or piece of computer equipment is easy to use. It obviously means different things to different computer users.

Utility program. A program that performs a general function such as copying disks or translating a program from one computer language into another.





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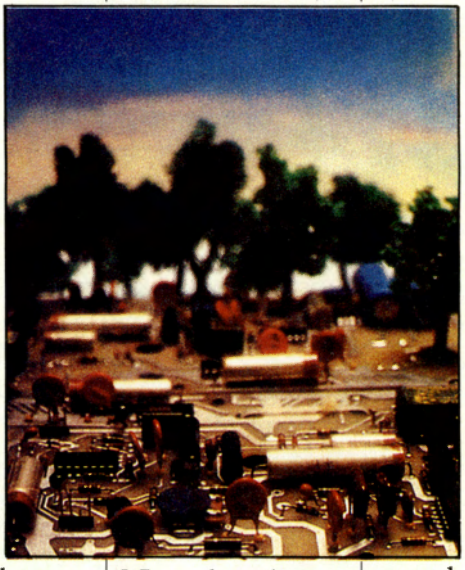


What's Ahead for Junior

Oh, those ads for personal computers! So often they show the shiny new machine all alone on a desktop. Maybe with a long-stemmed rose or a coffee cup, but never any wires, paper, or clutter. Of course, anyone who uses a computer, either at home or at work, knows that a microcomputer doesn't stand alone on most desks. In fact, many computer users complain that the computer they bought to organize things has turned their workspace into a jumble of wires, disks, papers, peripherals and documentation.

This state of affairs—a desktop computer that resembles a dialysis machine with add-on equipment and wires running everywhere—is what many PC*jr* owners have to look forward to. The truth is that to make your PC*jr* do all the things it's capable of doing requires a lot more than a system unit, a keyboard, and a monitor. But then, half the fun of computing is souping up your computer, adding a memory card here and a disk drive there. This article takes a look at the expansion hardware and software for the Junior that you can expect to see on the market in the near future and explains how each new product makes the PC*jr* more powerful.

If you're a first-time user, don't buy these products before you have a chance to log some hours on your PC*jr*. Some home users will find that an off-the-shelf PC*jr* is all the computing power they need. But just as many will eventually get the urge to add a little oomph to the computer system.



New hardware and software products will expand the horizons of the PC*jr*.

Most of the add-on hardware in the works for the PC*jr* is designed to run software that the entry and enhanced versions can't handle. The Junior's 128K memory and its one disk drive rule out some sophisticated and memory-hungry programs, especially the so-called "integrated" business systems, which combine many applications—database management, telecommunications, word processing, and spreadsheets—into one software package. These programs typically require 256K of memory and work best with two disk drives. Is there any way Junior can run "integrated" software and other programs that exceed its present capabilities?

The answer is a qualified yes. Junior's 8088 microprocessor stands ready to address a megabyte (one million bytes) of memory at once, while the ceiling for memory expansion designed into the computer is 640K RAM—the same as IBM PC.

So there's no technical reason preventing the expansion of Junior's memory far beyond its original 64K or 128K RAM. The only problem is one of physical space inside the PC*jr* system unit. Since the expansion slots built into the main circuit board are reserved for

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IBM-approved boards—64K memory and display expansion, internal modem, disk controller card—some printed circuit boards with extra memory chips will attach to the system unit through the 60-pin input/output connector on the right side of the computer and be housed in separate modules. But once the actual restrictions on these slots are determined, boards with more features and more memory than IBM's will most likely be made to fit the Junior's internal expansion slots.

What about a second floppy disk drive? As with the expansion boards, there's a parking problem here. The Junior's "half-height" disk drive is sleek and slim but still leaves no room for another drive in the PC*jr* console. An additional disk drive will have to sit outside the system unit and will require a new controller card or minor modifications to the existing card. But the Junior's disk controller *chip* and the disk operating system (PC DOS 2.1) can accommodate several additional disk drives.

Can Junior handle a hard disk system? There's nothing to prevent you from attaching a hard disk drive to the PC*jr*, provided you have $1500 to $3000. PC DOS 2.1 can be used with a hard drive. However, because the PC*jr* lacks the feature direct memory access (DMA), a hard disk attached to the Junior will be slowed down considerably.

When you load DOS into the PC*jr*, you're asked to type in the time and the date. Entering this information allows DOS to label files with the date and time that information was last written in them. A system clock automatically enters those numbers and saves you a little hassle. These clocks need very little power to run; their source is usually a tiny lithium battery. As convenient as a clock may be, taking up an entire expansion slot for this feature makes little sense. Manufacturers of expansion circuit boards realize this, and offer instead multifunction boards that plug into one slot and include a clock along with other features such as memory expansion and serial and parallel ports for attaching modems or printers.

The PC*jr*'s keyboard is the component most likely to be replaced by users with another company's product. When IBM announced the Junior with its unique keyboard, several makers of computer keyboards geared up to offer users a wide variety of replacements. Some replacement keyboards for the IBM PC, with all the PC's function keys, are now available for the Junior. Also look for keyboards the same size and shape of the Junior's but with traditional typewriter keys.

There's no technical reason preventing the expansion of Junior's memory far beyond its original 64K or 128K RAM.

What products will build on the Junior's unique features and capabilities? IBM has already announced a local area network system that allows the PC*jr* to communicate and share peripheral equipment with other IBM computers. This capability makes Junior a full-fledged member of the IBM family of computers.

As we've noted, the reason most users expand their microcomputers is to take advantage of the best possible software. The PC*jr* may offer a different and less expensive way to run sophisticated programs instead of the traditional method of adding lots of memory boards and disk drives. Junior has two cartridge slots, which can each hold a ROM cartridge with up to 32K of program storage. Of course, this is read-only memory so the user can only take information from the cartridges; recording or saving data on them can't be done. Some software publishers have announced plans to offer their programs on PC*jr* cartridges.

Most computer industry watchers expect a full range of expansion products for the PC*jr*. But all the hardware in the world plugged into the Junior's console isn't worth the volts it takes to short it out if software doesn't exist to make it all do something useful for you. Because of its ability to run so many of the programs written for the PC, the Junior was launched with more programs to run on it than most personal computers can attract after years on the market. These programs, plus the programs written specifically for the PC*jr* (which are just beginning to appear) will make Junior owners what you might call "software secure" for years to come. ■



How Much Junior Does a Family Need?

Three households in the market for a home computer eye the PC*jr* and cost out a complete system.

Elisabeth Warren is a third grader struggling with some age-old problems facing children her age—multiplication tables and long division. Early in the school year she announced to her mother Nan that she couldn't and wouldn't learn her math. "Sweetheart, I can say I don't do windows," recalls Nan, "but you can't say the same about division."

Nan and her husband, Jim, think a home computer might challenge Elisabeth into learning her math. "I'm looking for programs that will entertain Elisabeth and hold her interest while she learns," says Nan. "And once we got it home, I'm sure we'd find other things we could use it for." The Warrens, who live in a suburb of San Francisco, are like many families that buy a home computer for their kids' education. But what else will they find they can do with a personal computer?

Nan might find a PC*jr* useful with her work on the finance committee of a local private school. With a simple spreadsheet program, she can create financial models based on predicted levels of alumni donations, tuition costs, and projected expenses. She has also been looking for a way to organize her favorite recipes from the 138 cookbooks she owns, and the Junior has software that will help her set up files.

Jim wants a tool to help him keep track of the family expenses and investments for reckoning with the IRS at tax time. And Jessee, who has started to use a computer in his first-grade classroom, would love to try out the games that are available for the PC*jr*.

Since the Warren's primary use for a home computer would initially be for education purposes, they might consider starting with the entry level PC*jr* and connecting it to their color TV. Many good educational programs are being converted to PC*jr* cartridges ($30-$40 each) that will run on the $700 entry model. If Nan and Jim find themselves with the time and interest to transfer some pencil and paper jobs to the computer, they can add the extra memory and disk drive to handle accounting and home management software.

Before they buy either the entry or the enhanced PC*jr*, they should ask Elisabeth's teacher about appropriate software, then check to see if it is available on disk or cartridge.



The Warren family of suburban San Francisco is looking for a home computer and software that will help the children with their schoolwork.

CHRIS STEWART



MARIAN GOLDMAN

Arthur Golden, Jr. is leading his family into the computer age.

Arthur Golden, Jr. is a business card-carrying member of the computer generation. A senior at Fordham Prep School in New York City, Arthur works part time as a volunteer with the Computer Assisted Learning Lab in Brooklyn and he takes obvious pride in handing out his business card. When he's not helping young children get started with computers at the lab, Arthur can be found working on one of his school's microcomputers.

Arthur is clearly the lead computer user in the Golden household, and his interest has started his parents and his sister thinking of ways a computer can help them. Arthur, Sr. is an independent insurance broker who works out of two offices—one on Wall Street and one in the basement of his home in Queens. He hopes to establish a computer network between his two offices. Young Arthur thinks his father is reluctant to jump right in and buy a computer "because he's afraid he'll press the wrong button and all his work will disappear forever." But his father says he just hasn't found good software written specifically for the insurance business. Mrs. Golden helps with the insurance business at home, and also works at a travel agency. She recognizes the power of the computer for her work and has enrolled in a word processing course. Thelma is a freshman at Smith College and, although she hasn't been bitten by the computer bug like her brother, she does use a word processor at school.

Arthur, Jr. is already shopping for a home computer; he reads computer magazines regularly and pays close attention to software reviews. "You can have the most powerful hardware money can buy," he declares, "but if it doesn't run the software you like, it's just going to collect dust."

The Goldens need a loaded PC*jr* package—the enhanced model with 128K memory and the disk drive ($1270) to run insurance modeling software and the internal modem ($200) and a terminal program (available on Cartridge BASIC, $75) so the PC*jr* can send messages and share information with the computer in Arthur, Sr.'s city office.

Add a letter quality printer for business correspondence ($700) and an RGB monitor that displays 80 columns of text ($600) and the system is $2845—before any software investments.

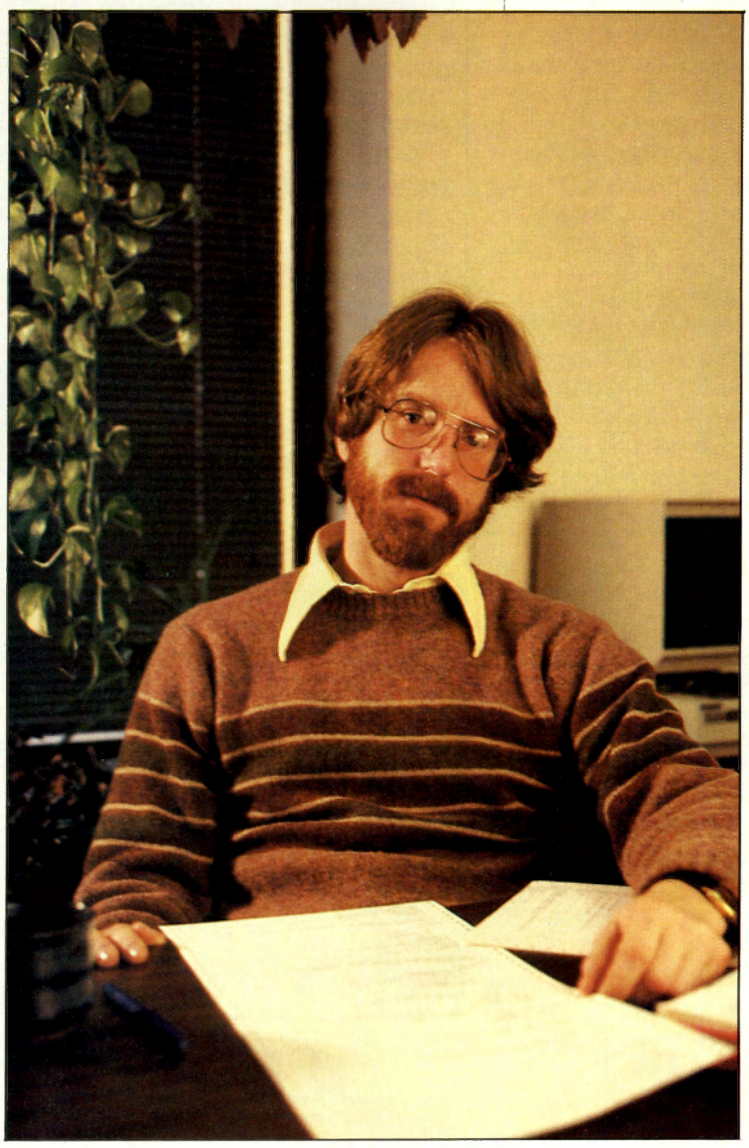
Jeff Gilles is a project analyst at the University of Iowa whose job consists of recommending database programs to professors from different departments, then helping them get the package running. Since Jeff and most of the professors use the university's army of IBM PC's, he wasn't surprised when some professors started talking about buying PC*jr*'s as a home computer for their families to learn with and for themselves to do work at home on. The professors are used to coming to Jeff for computer tips, so they asked him if this was a feasible arrangement.

"Much of the work these teachers do on the computer involves word processing," says Jeff, "so it makes perfect sense to start a project at work and have a computer at home that they can use to continue working on the same project at night and on weekends. And with a Junior equipped with a modem and a terminal program, they can communicate from home with the university's mainframe computers or even call the PC in their office to update a gradebook," he adds.

But what about Jeff? Does a PC*jr* at home make sense for him? What kind of jobs would he do on a home computer and what software would he require? "I'd need mostly financial accounting and budgeting software," says Jeff. "Recently I sold one house and bought another that I've done a lot of work on. I'd use the PC*jr* to keep track of money spent on the new house's improvements. That way, come tax time, I'll have a record of all my potential deductions."

What about database management—would Jeff use one of the packages he works with during the day at his job on the PC*jr* at home? "No, for me it wouldn't do to take much work home," he says. "The database programs and files that I use eat up huge chunks of computer memory. My office PC has 512K and sometimes that's not enough. With the Junior's 128K, there's no way it would handle those programs. And besides, I'm not a hardcore hacker. After working all day on a PC, I'd rather come home and do a little carpentry work, instead of staring at another monitor all night. A home computer would be an efficiency tool to make my personal financial work easier. I wouldn't use it as a diversion."

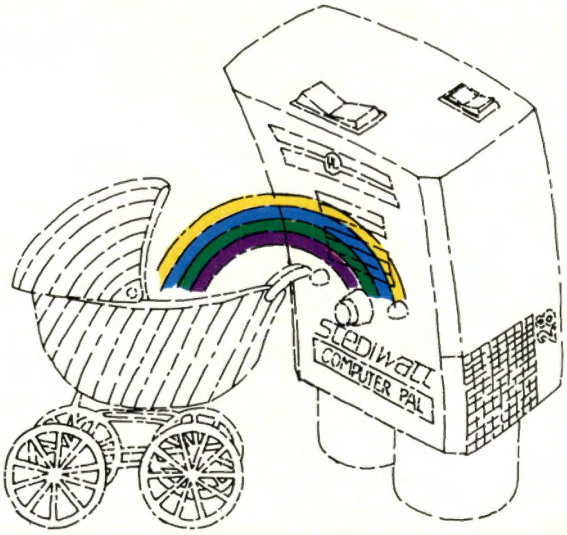
Jeff needs an enhanced PC*jr* ($1270) for a home machine. He needs the disk drive and 128K RAM to run accounting software. He will also need a good RGB monitor ($600) that will display 80 columns of text at a time. The high resolution of the monitor's display will save his eyes from additional strain. So the basic hardware of Jeff 's home system will run about $1870. Add a few adapters and cables, as well as software packages, and the total cost reaches $2000.■



Jeff Gilles is looking for a home computer that's a financial tool, not an entertainment center.

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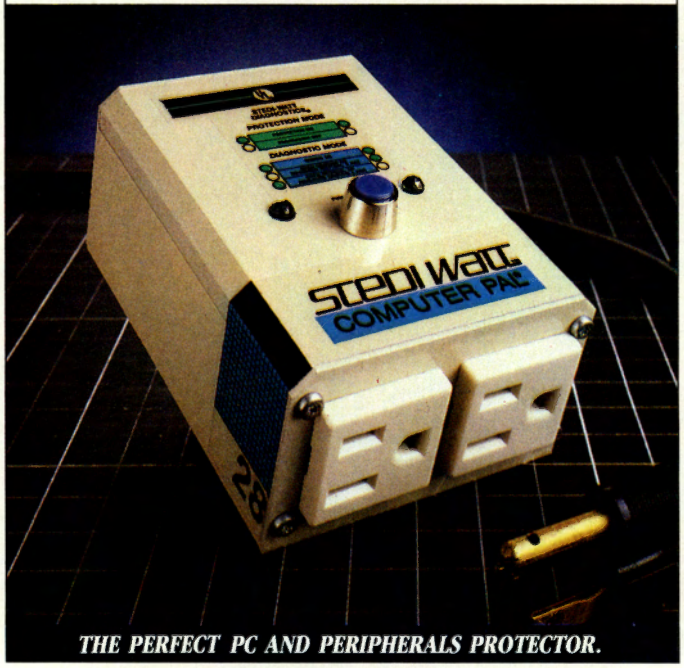
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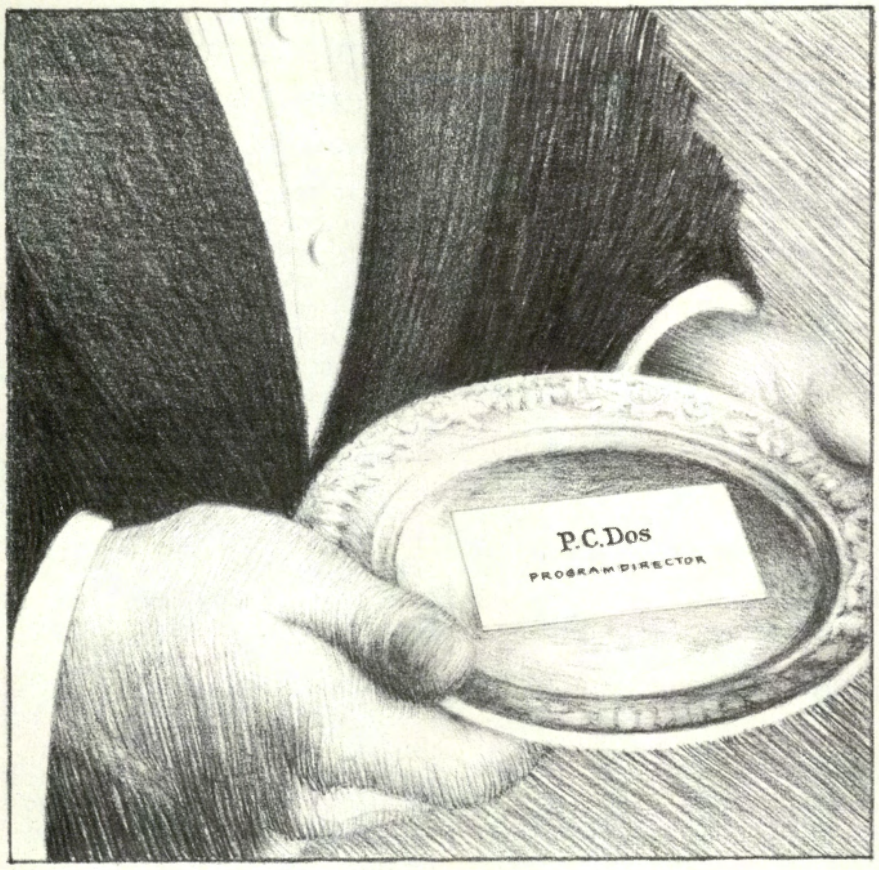
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GUIDED TOUR



CLARE WOOD

Introducing PC·DOS, the Program that Gets Junior Up and Running

BY MARK A. GOLLIN

Welcome to PEANUT's Guided Tour! Each month we'll take you by the hand and walk you through a technical aspect of personal computing. Computing tasks that can often mystify the first-time user will be spelled out step-by-step in non-technical, easy to understand language. So join us on our first tour—a look at Junior's DOS 2.1.

DOS 2.1 is Junior's Disk Operating System. It controls the transfer of data between the computer and the disk drive; DOS prepares the computer to interact with software. While some software programs come already formatted with DOS, other programs require you to first load the DOS disk into the disk drive before you can begin working. (Software instructions specify if you need to load DOS.) When you load the DOS disk, this is called "booting"; it allows the computer to obey commands or programs.

Our first tour will consist of making two back-up disks for DOS. This is something we strongly recommend—DOS is the most important disk that you will ever own, and it's a good idea to have extra copies in case one is lost or ruined.

The only tickets you need for this tour are two blank disks. You already have a PC-DOS disk; it is in the back of the loose-leaf DOS manual. OK—here we go!

First, put your PC-DOS 2.1 disk in the disk drive with the label toward you, facing up. Insert the disk all the way into the disk drive, and then carefully close the latch by pressing it down. If you feel any resistance, take the disk out and try again. Remember, diskettes are delicate, and you can damage one by bending it or inserting it into a disk drive the wrong way.

Next, turn on the power to your PC*jr* and your display (either a television set or a color monitor). The display should show a screen with the letters IBM in white on a blue background, and a set of colored bars. If you look closely, you will see a number in the bottom right hand corner of the screen followed by the letters "KB". This number will increase until it reaches 64 or 128 (depending upon how much memory you have installed in your PC*jr*). Now, the disk drive will turn on and whir for about ten seconds. During this time PC-DOS 2.1 is being taken off the disk and put into your PC*jr*'s memory. Next, the computer would like us to enter the date and time, but if you're in a hurry, just press ENTER twice. Finally, the screen will clear and on the top line of the display you will see "The IBM Personal Computer DOS." On the next line it should say "Version 2.10 (C) Copyright IBM Corp. 1981, 1982, 1983." Finally, on the fifth line, you should be rewarded by the characters "A>" followed by a blinking underline. The blinking underline shows where what is typed on the keyboard will show up on the screen. It is called a cursor.

The "A>" is DOS 2.1's way of saying that it is ready for a command to be entered; it is also known as a prompt. To get DOS to perform a command, all you have to do is to type the command and then press ENTER. You can type commands in upper case or lower case (or even a combina-

tion of the two). DOS will understand either.

Let's try a simple command first: type DIR and press ENTER. As soon as you press ENTER the disk drive will whir and, after a few seconds, the screen will fill up with text.

What happened was this: by typing DIR, short for directory, you requested a listing of all the files stored on the DOS 2.1 disk. DOS gave you all this and more. Each of the lines in the directory listing tells all about one particular file. The first column tells the name of the file (for instance, the name of the last file is BASICA). The next column tells you the extension for that particular file. An extension is a three letter combination that DOS uses to identify types of files. A file could be a program, a list of numbers, a letter, or anything else that needs to be stored on disk. The extension helps you figure out what a particular file is for. Some commands require you to type the extension after the file's name, with a period in between. For instance, the last file in our directory listing might be referred to as BASICA.COM.

The remaining two columns in the directory listing give the date and time of the last modification of a file. This information is useful when you want to figure out which of two files is the more recent. But for this information to be accurate, you must type in the date and time each time you boot the DOS diskette.

Now that we have used the DIR command to look at a listing (or directory) of all the files on the disk, we'll move on to another important command: DISKCOPY. This command allows you to copy all the information stored on one disk to another disk. We will use this command to make those two copies of the PC-DOS 2.1 disk.

Here's how to copy your PC-DOS 2.1 disk, a procedure similar to making copies of other disks. First, type DISKCOPY A: B: and press ENTER. You should see the message "Insert source diskette in drive A: Strike any key when ready." The term "source diskette" refers to the disk that you would like to copy because it is the *source* of the information. Since the disk we would like to copy is already in the disk drive, simply press any key. The disk will whir, and then you will be presented with the message "Copying 9 sectors per track, 1 side(s)," and then, after a short pause, "Insert target diskette in A: Strike any key when ready." The term target diskette refers to the disk onto which we would like to copy information. Open the disk drive door, remove the DOS 2.1 disk, insert one of your blank disks, close the disk drive door, then press any key. You'll get the message "Formatting while copying," and then, after another short pause, "Insert source diskette in drive A: Strike any key when ready." Now remove your diskette, insert the DOS diskette, and press any key. You will need to swap diskettes three times (or six if you don't have the Memory and Display Expansion Card), inserting the source diskette (your PC-DOS disk) or the target diskette (the blank you supplied) as requested until you see the message "Copy complete. Copy another (Y/N)?" Type *Y* and repeat the entire procedure, only this time using your other blank diskette. You will still use your PC-DOS 2.1 disk as the "source" diskette. After you get the "Copy complete. Copy another (Y/N)?," press *N*, and you will be presented with the "A>" prompt.

All of this copying is tedious, but necessary. Now that you have two new copies of the PC-DOS 2.1 disk, label one of the copies "PC-DOS 2.1 Working Copy," label the other copy "DOS Test Disk," and take the original PC-DOS 2.1 disk and put it in a safe place. From now on, whenever you have to boot PC-DOS, use your working copy. If you ever damage your working copy of PC-DOS 2.1, make another one from your original diskette.

Now that the copying process is over, let's continue with the tour. The next command we will deal with is ERASE. As you might expect, this command allows you to erase files from a disk. Let's try it out. Insert the disk labeled "DOS Test Disk" in the disk drive, and type DIR and press ENTER to get a directory. See the file BASICA.COM? That's the file we're going to erase. Type ERASE BASICA.COM and press ENTER. The file will be erased by PC-DOS. To check that the file is really gone, type DIR and press ENTER. BASICA.COM should be gone from the list.

Once you have erased a file, it is almost impossible to get it back. DOS forgets that the file has ever existed. Thus, you should use the ERASE command with *extreme* care.

Use the ERASE command with extreme care.

The next command on our tour is COPY. This command is similar to DISKCOPY, but instead of working on a whole disk at a time as DISKCOPY does, COPY works on one file at a time. Let's use this command to make a copy of the BASICA.COM file to take the place of the one we just erased. Insert your diskette labeled "DOS 2.1 Working Copy" into the disk drive and type COPY BASICA.COM B:BASICA.COM, and then press ENTER. When DOS prompts you to "Insert diskette for Drive B: and strike any key when ready," insert your "DOS Test Disk" into the disk drive, and press any key. BASICA.COM has now been copied to your "DOS Test Disk." Again, you can check to see that this is true by typing DIR and pressing ENTER (Note: this time, when you type DIR and press ENTER, you are presented with the message "Insert diskette for drive A: and strike any key when ready." Just press any key, because we want a directory of the diskette in the disk drive. DOS gives us a chance to switch diskettes because it realizes that we just switched disks for the COPY command, and the correct disk might not be in the disk drive.)

Now we're nearing the end of our tour, but we will have two more subjects to cover. The next command we'll look at on our tour is CHKDSK. Try it out by typing CHKDSK and pressing ENTER. This display gives you all kinds of information about your computer and the diskette that is in this disk drive. The first line tells you the total amount of disk storage space that you have on your PC-DOS disk. The second line tells you how much space is being taken up by files that don't appear in the directory listing. The next line tells you how much space is being consumed by the directory of the disk (DOS needs to keep this information somewhere on the disk so it

can find your files). The fourth line tells you how much space is being taken up by all the other types of files on the disk. Finally, the last two lines tell you how much memory you have installed in your PCjr, and how much of it is available. That's quite a bit of information for one command! This information can come in handy. For instance, you can use CHKDSK to determine whether enough space is left on a disk to store one of your files.

Now, the final stop on our tour is running, or executing as it is sometimes called, programs from PC-DOS 2.1. This is extremely simple. Let's say you've purchased *HomeWord* so that you could do word processing on your PCjr. In the *HomeWord* instructions, it states that you should execute the program HW to begin. How do you do this? It's very simple. After you have booted DOS, and you receive the "A >" prompt, simply insert your *HomeWord* diskette and type HW and hit the ENTER key.

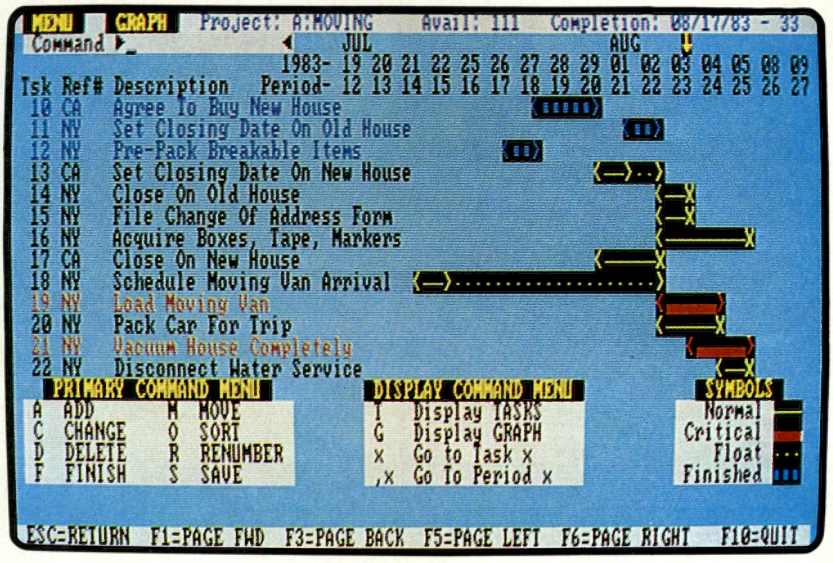
That completes our short tour of PC-DOS 2.1. This tour did not teach you everything there is to know about DOS, but it should help you become more comfortable with it. To find out more about DOS, read the manuals that came with it. The thin volume is the *Disk Operating System User's Guide*, a simple manual that covers many of the commands discussed here. You should read the *User's Guide* first, as it serves as a useful introduction to some of the more complex commands. To really take advantage of the full power of PC-DOS 2.1, however, you will need to read the *DOS Reference Manual*. This manual is more complicated, but it discusses all the DOS 2.1 commands. Read it, and experiment with your DOS Test Disk if you don't understand something. The only thing you risk when you experiment is the diskette in the disk drive, and since the DOS Test Disk does not contain anything that you don't have two copies of, it is the perfect choice. Have fun!

Mark A. Gollin is a computer programmer for Random House's School Division. He also works as an independent consultant, helping first-time users feel at ease with their personal computers.

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Circle No. 122 on Reader Inquiry Card

PEANUT wants to get to know you! And we want to give you a chance to win $1000 worth of PC*jr* software.

Dear Reader:

You can help us continue to make PEANUT the most practical PC*jr* magazine available today. Just tear out the adjacent page and answer the questions on both sides. Then fold it in half, staple or tape it together, and pop it in the mail. The return postage is prepaid. Answering the questions will only take a few minutes—and the investment will bring you not only hours of good reading and computing, but also a chance to win $1000 worth of PC*jr* software!

We've put together a package of Peanut software that includes a word processor, games, education programs, and much more. Every completed questionnaire that is returned by May 31, 1984 with a name and address will be included in the drawing for this special software starter kit. The winner will be announced in our October, 1984 issue.

We hope to hear from you. And we welcome any additional comments that you think are pertinent to this questionnaire.

Thanks for your help.

John Peanut

Reader Survey

Please tear out this page and answer the questions on both sides. Include your name and address only if you want to. But remember, to be eligible to win the package of PC*jr* software worth $1000, you have to let us know who you are and where you live, and you must return the completed questionnaire by May 31, 1984.

1. Do you currently own or use a computer at home for personal use?

☐ Yes ☐ No

If so, what kind? (please specify make and model)

_____

2. Do you use a personal computer where you work?

☐ Yes ☐ No

If so, what kind? (please specify make and model)

_____

3. Do you intend to purchase a personal computer in the next 12 months?

☐ Yes ☐ No

If so, what kind? (please specify make and model)

_____

4. Are you considering the purchase of an IBM PC*jr* in the next 12 months?

☐ Yes ☐ No

5. You are:

☐ Male ☐ Female

6. You are:

☐ 13-18 ☐ 36-40
☐ 19-24 ☐ 41-45
☐ 25-30 ☐ 46-50
☐ 31-35 ☐ over 50

7. Your education:

☐ Graduated high school ☐ Graduated college
☐ Attended college ☐ Post graduate

8. Your occupation:

☐ Business Owner ☐ Manager/Administrator
☐ Clerical ☐ Marketing/Sales
☐ Educator ☐ Professional
☐ Engineer/Scientist ☐ Student

☐ Other (please specify)

9. Do you have children at home?

☐ Yes ☐ No

If yes, how many? _____

What are their ages? _____

10. Do your children use computers at home or in school?

☐ Yes ☐ No

11. If not, do you expect your children to be using computers in the next 12 months?

☐ Yes ☐ No

If you answered yes to questions 1 or 2 . . .

12. For which functions do you use a computer in your work? At home?

Word processing	☐ Work	☐ Home
Programming	☐ Work	☐ Home
Data communications	☐ Work	☐ Home
Financial planning	☐ Work	☐ Home
Tax planning	☐ Work	☐ Home
Mailing lists	☐ Work	☐ Home
Sales analysis	☐ Work	☐ Home
Engineering/design	☐ Work	☐ Home
Database management	☐ Work	☐ Home
Spreadsheets	☐ Work	☐ Home
Education	☐ Work	☐ Home
Children's education	☐ Work	☐ Home
Computer graphics	☐ Work	☐ Home
Games	☐ Work	☐ Home
Music	☐ Work	☐ Home

Other (please specify)

_____

13. Which of the following peripherals are currently connected to your computer at work or at home? Which do you plan to add or replace in the next 12 months?

	Now have	Plan to add or replace
Printer	☐ Work	☐ Home
Plotter	☐ Work	☐ Home
Modem	☐ Work	☐ Home
Monitor	☐ Work	☐ Home
Floppy disk drive	☐ Work	☐ Home
Hard disk drive	☐ Work	☐ Home
Joystick	☐ Work	☐ Home
Graphics tablet	☐ Work	☐ Home
Expansion board	☐ Work	☐ Home

Other (please specify)

14. Which of the following general telecommunications services do you use your computer for at work and at home?

Database access	☐ Work	☐ Home
Electronic bulletin board	☐ Work	☐ Home
Electronic mail	☐ Work	☐ Home
Electronic banking	☐ Work	☐ Home
Electronic shopping	☐ Work	☐ Home

Other (please specify)

_____

15. Which of the following electronic information services do you access by computer at work or at home?

BRS	☐ Work	☐ Home
CompuServe	☐ Work	☐ Home
Dialog	☐ Work	☐ Home
Dow Jones	☐ Work	☐ Home
NewsNet	☐ Work	☐ Home
The Source	☐ Work	☐ Home

Other (please specify)

_____

16. Do you belong to a computer users group?

☐ Yes ☐ No

If so, is it organized for users of one brand of computer?

☐ Yes ☐ No

If so, which brand? (please specify make and model)

_____

17. Were you involved in the decision to buy the computer you use at work or at home?

Yes	☐ Work	☐ Home
No	☐ Work	☐ Home

If so, what sources of information did you use in deciding what to buy?

TV/Radio	☐ Work	☐ Home
Magazines/Newspapers	☐ Work	☐ Home
Books	☐ Work	☐ Home
Manufacturer's or dealer's literature	☐ Work	☐ Home
Advice from computer users	☐ Work	☐ Home
Advice from consultants	☐ Work	☐ Home

Other (please specify)

_____

From what source did you buy the computer?

From retailer	☐ Work	☐ Home
From manufacturer	☐ Work	☐ Home
By mail order	☐ Work	☐ Home

Other (please specify)

_____

18. What kind of articles would you like to see more of in PEANUT?

_____

_____

_____

_____

19. Name _____

Address _____

_____

_____

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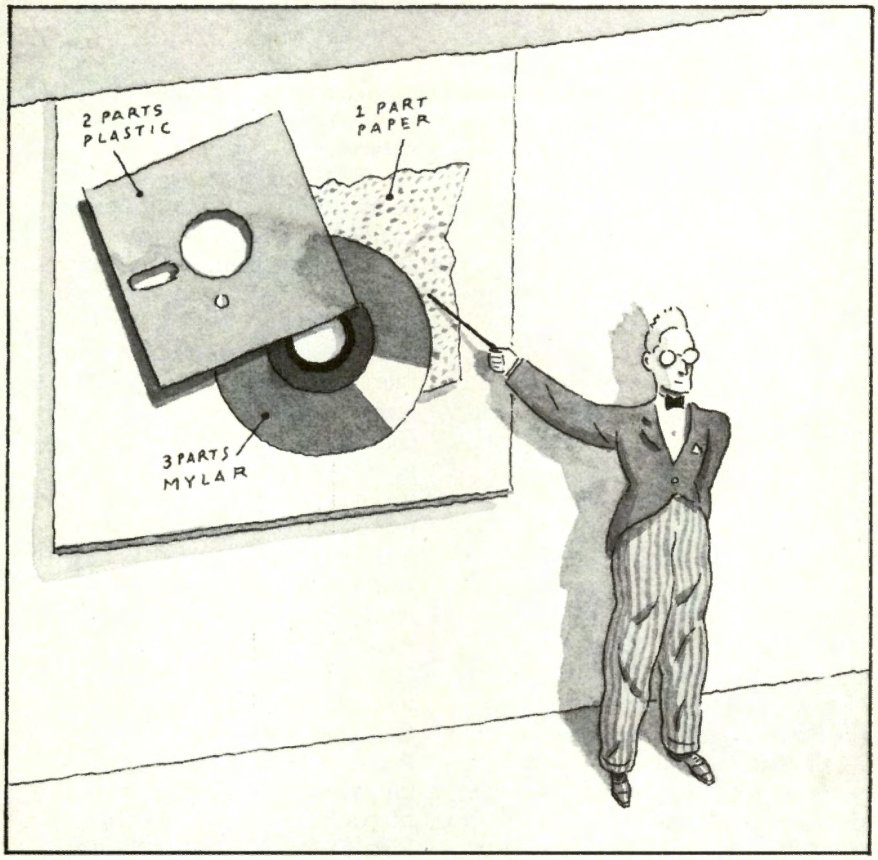
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PEANUT SOLVER



STEVEN GUARNACCIA

X-Ray Danger? Is Junior Fast? What's a Floppy Disk Made Of, Anyway?

Q: I plan to use my color TV in place of a monitor for the PCjr. Is there a risk of being exposed to too much radiation?

A: Neither video display terminals nor television sets give off enough x-radiation to worry someone using a microcomputer hooked up to either device. A July 1983 study by the National Research Council determined that VDT's emit less radiation than the fluorescent lighting in a typical office or the sunshine to which you're exposed by walking down the street on a bright day.

As for televisions, the Health and Safety Act of 1968 set a federal standard limiting the amount of x-radiation to be emitted by televisions produced during or after 1970. According to this Food and Drug Administration policy, no color or black and white television set can give off more than 0.5 milliRoentgens (mR) per hour of x-radiation. Actually, most televisions emit far less than this 0.5 mR safety standard allows. Arthur Ball, a regulatory officer at the television product section of the FDA's national center for devices and radiological health (NCDRH), explains that most televisions "emit radiation which is nondetectable, indistinguishable from natural background . . . cosmic rays and such."

Dr. Edward Lee Nickoloff, associate professor of radiology at Columbia University, and chief hospital physicist at Columbia Presbyterian Medical Center, explains that this small degree of radiation is not harmful. "It takes hundreds of thousands of milliRoentgens of x-radiation to have any kind of deleterious effect on a person," he says. "You would have to spend an exorbitant amount of time in front of the television to produce any measurable effects, and even these effects would not be harmful."

Sets produced before the 1970 standard could emit more than the 0.5mR per hour allowed by the FDA standard and might be unsafe. William Leow, chief of NCDRH's television product section, says, "I personally wouldn't recommend the use of a pre-70 set." He adds, "If you must use an old set, have it tested by a qualified serviceman and make sure he adjusts all controls to the manufacturer's specifications." But while the radiation emitted from an adjusted pre-70 set "will most likely be below the 0.5 mark" says Leow, "it may be higher than the radiation level of a newer set."

Unless you have a very old television set (pre-1970) your main reason for choosing a computer monitor over a television would be for the monitor's higher resolution. If you are planning to use your PCjr for a great deal of word processing or spreadsheet evaluation, you will want the increased readability of characters and numbers that higher resolution provides. Whatever equipment you choose, be it TV or monitor, the following advice from the American Optometric Association can help you prevent eyestrain and the dis-

comforts that can often result:

■ Position furniture so that you sit at a comfortable distance from the viewing screen. (If different-sized family members will be using the Junior, choose a swivel chair on which you can adjust the height.)

■ Avoid excessive head movements by keeping your reference materials close by.

■ Shield the screen from glare, and take brief rests when working at the computer for long periods of time.

For more information on eyestrain from using a computer, send a self-addressed stamped envelope to "Vision and the VDT Operator," American Optometric Association, 243 N. Lindbergh Blvd., St. Louis, MO 63141.

Q: Is the Peanut portable?

A: At less than six pounds for the basic "entry" model and less than nine pounds for the "enhanced" model (the disk drive adds most of the extra weight), the PC*jr* is a very portable machine. However, preparing your PC*jr* for travel involves taking some precautions.

Always protect the Junior with adequate covering and padding. Save the box the Junior comes in, the protective padding in which it is wrapped, and the cardboard that fits into the disk drive to keep the disk head from banging around inside its metal casing.

The Junior should always be kept away from moisture. Sam Howe, a consultant in Narbeth, Pennsylvania, who often takes a computer along when he travels, recommends that once you have the Junior all boxed up, wrap the entire package in plastic trash bags. He also warns that since the PC*jr* should not be stored in temperatures lower than 32 F (0.6 C) or higher than 140 F (60 C), it's risky to carry your Junior in the trunk of a car or leave it in the baggage compartment on a plane or train.

If you would like your portable PC*jr* to have a slightly more elegant look than garbage bags lend, IBM sells a carrying case for $60 that has space inside its foam-padded interior for the system unit, the keyboard and cable, the transformer and cord, the connector for a TV, the parallel printer attachment, up to four program cartridges, and five diskettes. It weighs nineteen pounds completely loaded.

Q: Can static electricity damage the Peanut?

A: If the room you've chosen for your new computer has a wool rug, you'll have to be watchful of static electricity, especially in dry winter weather when the heat's up high. In a static-creating environment, you could introduce unwanted electrical charges into the Peanut's circuitry by simply touching the keyboard or system unit before grounding yourself (making electrical connection with the earth). While it's unlikely that you would actually damage a chip by giving the Junior a jolt in this way, you might consider buying an anti-static mat to place directly under the computer or under the computer table. (Some vinyl mats that go on the desk and under the processing unit actually provide a wire for grounding to a wall socket or other metal object.) If you don't want to spend the $50 or $60 that these mats usually cost, you can buy a $6 can of anti-static spray to use when static levels seem particularly high.

Some people take no chances with static, and spray everything with anti-static spray. Melody Newrock, manager of retail sales at Future Information Systems, a New York City store, says, "I spray everything. I even spray the dog." Others, not as vigilant, do recommend the anti-static mat as a routine precaution.

While you'll want to come up with a solution appropriate to your own home, you may find that if your computer chair has a metal base (without wheels to pick up static as they move around), you'll have enough of a grounding to keep static from being a problem.

The PC*jr* is not likely to cause any kind of electrical problem in your home.

Q: Besides static, can the Junior be harmed by any other household hazards?

A: While your PC*jr* may soon be as familiar as your favorite easy chair, you won't want to dust it like any piece of furniture. When using furniture sprays such as Endust or Lemon Pledge, keep them away from the Junior. Marc Barnett, a sales representative for Computerland of Wall Street in New York City, warns that these sprays could go into the Peanut's vents and gum up the system. He recommends using a cloth dampened slightly with water to dust off the Peanut; if you'd like, add a small amount of mild soap. Always keep heavy amounts of water away from the computer—the keyboard in particular. Along with dust and water, food should be kept well away from the Junior. To prevent over-heating, your computer should never be placed on or near a radiator, furnace, or other heating unit.

Q: Can I plug my Peanut into any wall socket in the house? Does it require any special connections? Will it interfere with other electrical appliances?

A: You can plug the Junior into any wall socket as long as it is served by 120 volts of AC power. You'll want to ground the Junior just as you would a refrigerator, but beyond this simple precaution, your main concern as a Peanut electrician will be preventing power drains and surges or spikes.

If at all possible, plug your PC*jr* into its own separate electrical line. If that's impossible, choose a line for your Junior that will not subject it to the sudden surges and drains in power caused by turning on and off high-wattage appliances. While it's fine for the Peanut to share its line with a lamp or television set, it's best not to plug it into the same line that serves the power tools in the basement, the hairdryer in the bathroom, or the iron in the laundry room. Other high-wattage appliances to avoid include air conditioners and appliances on power cycles such as re-

frigerators and washing machines. Check your fuse box to determine which lines are used for these appliances. Then decide which line is your best bet for the Junior.

If you live in an apartment, you can't really control where your neighbors plug in their stereos, toasters, or rice-cookers, so a strain on the electrical system might occur while you're entering information on the Junior. In these cases, you might have to type in the data a second time.

Losing an hour's worth of work to a power surge or drain will probably make you angry enough to seek a solution to the power problem. The easiest solution is to buy a "surge protector." They sell for $40 to $125 (the more expensive varieties are more suited for office than home use) and can provide protection against spikes on the line for four to six computer-related items on the same electrical strip. Some surge protectors also provide safeguards against current drains caused by large appliances. And they also protect against power spikes caused by lightning storms.

The PCjr itself is not likely to cause any kind of electrical problem in your home. Running the unit is equivalent to burning a 100-watt bulb and its video circuitry is fully shielded so that the Peanut's RF won't interfere with a nearby television's radio frequency.

Q: What if I get a phone call while using the Peanut and have to leave it for a short period of time? Should I leave it on or shut it off?

A: Don't shut off the computer unless you're finished using it for the day or plan to be away for more than two or three hours. The computer uses very little energy while it's on, and being on doesn't burn out its chips or microcircuits. What is hard on the computer are the heating up and cooling down cycles that it goes through each time it's turned on and off.

When you're finished working and are ready to shut off the computer, don't forget to type SAVE and the name of the program or file you're working on so all that information will move to a cassette or a diskette for storage. The memory you were using to store your program or information while the computer was on is erased when the power is switched off—unless you've saved it, your program will be, too.

Not all of the PCjr's memory is erased when you turn off the power. The Junior actually has four kinds of memory: the temporary memory mentioned earlier, called RAM (Random Access Memory); internal ROM; external ROM; and external memory. Internal ROM (Read Only Memory) is the most permanent form of memory. It is burned into the computer's circuits; it's activated each time you switch on the computer. ROM's main function is to help bring in the Junior's operating system—the part of the computer that directs processing.

You can also provide the Junior with external ROM in the form of cartridges. One ROM cartridge that you're likely to add to your PCjr contains Cartridge BASIC, an enhanced version of the BASIC language that is in every PCjr's internal ROM. When you open up a cartridge containing BASIC or other information, you will see the memory or ROM chip on a small printed circuitboard.

RAM is part of the computer's circuits. You can only interact with a program or information when it is stored in RAM. The letters, numbers, and symbols that you type in are translated into machine language, a binary code of zeros and ones, that is represented in the computer as circuit junctions that are negatively (zero) or positively (one) charged. It takes eight junctions—one byte of memory—to store each letter, number or symbol. The computer's RAM is described in K, such as 64K or 128K. One K is 1,024 bytes of storage. So if your computer has 64K, it has over 65,000 bytes available while the current is flowing through its circuits. Although some computers maintain what is stored in RAM, the PCjr, like most computers, has this memory erased when the power is switched off.

To save what you were working on, you have to send it to external memory, usually in the form of a cassette or a diskette, which stores data and programs as magnetic patterns.

Don't shut off the computer unless you're finished using it for the day.

Because power surges, power outages, or programming errors can also erase what's in the computer's RAM, it's a good idea to SAVE frequently. Set fifteen minutes of work time as a saving point. You may not feel like stopping for the few seconds it takes to transfer your work to external memory when the fifteen minutes are up, but think how you'd feel if after an hour of work suddenly—*blip*—everything you'd accomplished was erased.

Q: What are floppy disks made of? How do they work?

A: In his book, *The Supper of the Lamb*, Robert F. Capon recommends that to cook an onion to perfection, you must really get to know it, peeling it away, layer by layer. If you want to really get acquainted with your floppy disk, it's not a bad idea to peel it away, casing and lining. (But with this recommendation, PEANUT SOLVER is obliged to point out that while you will be enlightened, you will also destroy your disk.)

Say you choose to sacrifice a floppy. What will you find inside? Once you lift the tabs on the black plastic casing, you'll see a lining that resembles a paper towel. Inside is a round, grey platter made of thin, flexible plastic and covered with a magnetic coating. It is this flimsy-looking disk that gives the floppy disk its name and it is on the magnetic surface that you store your information.

Notice that this circular platter is slightly stronger right around its center hole. When the disk is in the drive, clamped in, and rotating, this re-inforced inner-ring keeps the disk from being torn up by the pressure of the clamps that hold it in place. As

the disk spins, the drive's *read/write head* scans the disk's surface.

Disks rotate in the Junior's disk drive at 300 revolutions per minute. A part of the moving disk, then, is always exposed through the cut-out oval in its plastic casing. This way, the disk head—or the part of the computer that can read the magnetic signals on a disk, as well as write new signals to create new information on its surface—can come in contact with

Even if you are very careful with your disks, don't count on them lasting forever.

any part of the disk's surface, as all parts of a floppy's information-holding surface pass by this oval window.

If, for instance, you'd like to see a catalog of all the files on a disk, the disk head will move along the oval window until it rests on the part of the disk that is filled up with the disk's directory. Then when you're ready to load a particular file into the Junior's memory, the disk head will move along the exposed part of the disk until it finds where the file you've chosen begins.

The Junior uses double-sided disks. Each side of these disks has 40 concentric rings or tracks and each of these tracks is made up of nine sectors. With 512 bytes to every sector, a disk has a total of 368,640 bytes, or compartments for holding information (2x40x9x512). When you divide by 1024 (the number of bytes in one Kilobyte), you come up with 360K to a disk.

The Junior's disk operating system (DOS 2.1) tries to make sure that none of these bytes or storage spaces is ever wasted. DOS can break up large files into small pieces and stash them away anywhere on the disk, making the most efficient use of available space. In other words, because DOS stores information in such small units (the smallest such unit is one sector, or 512 bytes), it can, in a sense, squeeze a lot into one suitcase. Not only does it fit small, sock-size files into the 'corners' of a disk, it can also treat sweater-size files in the same way—breaking up large files and squeezing them into any available corner. Whenever you need one of these larger files pulled back together again, the disk head runs along the disk and scouts out all its pieces, wherever they may be stored. This way, when you call up a file, it appears in its entirety.

To ensure that your disks remain active receptacles for information, you'll have to take care of them. Always hold a disk by the top when placing it in the drive to avoid getting oil from your fingertips on the exposed oval of magnetic coating. When you are not using a particular disk, keep it in its paper jacket to prevent dust from collecting on the surface. Smoke particles as well can interfere with the ability of the disk head to read what's on a disk, so it's advisable to keep smoking to a minimum while using a computer and floppy disk.

Don't store your disks any closer than two feet to a telephone—a distance of three feet is even better. The electro-magnet that makes a phone's bell ring can erase a disk completely. Don't leave a disk too near a running electric typewriter, as some create magnetic fields that could partially erase a disk. Finally, choose a storage place away from a heater; even leaving disks on top of your monitor or television set may expose them to too much heat.

Even when you are very careful with your disks, keeping them away from dust, water, heat, and smoke and never bending or folding them, don't count on them lasting forever. Repeated contact with the disk head will wear a disk out, so make back-up copies of all your programs. (See next question.)

Q: Can I make a back-up disk with the Junior?

A: Every owner of an enhanced version of the Peanut should buy a copy of DOS 2.1, a program that controls the transfer of data between the computer and the disk drive and gives the Junior the ability to copy information from one disk to another.

Copying a disk takes about two minutes. To transfer the signals on one disk into the Junior's Read and Write Memory, and then copy them a second time onto a blank disk, first put the disk you'd like to copy—the source disk—into the disk drive. The computer will tell you when the information on this disk is loaded into RAM. Remove the source disk from the disk drive and put in the disk to which you are copying—the target disk. DOS guides you here as well, letting you know if you've somehow put the source disk back in again by mistake.

(In order for DOS to know the difference between the two disks, you'll need to put a "write-protect" tab on your source disk. This is a tab you place over a notch about three quarters up the right-hand side of the disk; once you've stuck it on you can't change what's on the disk until you take it off. Most blank floppies come with "write-protect" tabs, but a piece of scotch tape, though harder to remove, will work as well.)

When copying disks, the only complication you'll encounter is the fact that the Junior's memory is not big enough for it to accept all the information on the source disk at once. Each disk contains up to 360K of information while the Junior's RAM contains only 128K of storage space. With some of this temporary memory taken up by the video display (16K) and some used for DOS (24K), RAM ends up with room for only about one-quarter of the 360K on the disk. This means you'll need to switch the source and target disks several times to complete copying (DOS lets you know when to switch each time).

Swapping disks can seem like a nuisance to those used to copying on a PC with two drives—where one disk goes in drive A, and the other in drive B for 60 to 90 seconds until copying is complete. But think of the Junior's RAM as a drive-through garage the size of a Volkswagen bug, while the information on the disk is more the size

Copying a disk takes about two minutes.

of a Cadillac. What's on the first disk may need to go through the garage in four pieces, but when it's finished parking itself on the second disk, you still end up with two Cadillacs when you started with one.

Q: Is there any key or combination of keys that, when pressed, will damage my Junior?

A: No, says PEANUT SOLVER. There is no combination of keyboard commands that is in any way destructive to the Junior. Unless you actually break the keyboard by striking it with a hard object, you cannot harm the Junior by hitting a single key or group of keys.

While there is no need to fear inadvertently creating havoc in your Junior's circuitry by a misapplication of key commands, keep in mind that once you are inside a program, and actually entering data, there *are* commands that will interrupt the process by which you file away information. If you do interrupt a program before you have completed and saved your most recent entries, the facts you have just recorded will not be present the next time you open up your file to see what's in it. And while you will not have affected the software itself, you'll have to type in the data a second time.

Q: Why is the Peanut slower than its older sibling, the PC?

A: To keep the cost of the PC*jr* low, IBM designed it with simpler, less expensive circuitry than they chose for the PC—arriving at a machine more compact, in some ways more proficient, and slower.

A good example of this tradeoff in performance is the way the PC*jr* and the PC display graphics. Basically, the Junior displays a picture on its screen just as the PC does: its video circuitry translates codes, which are stored in memory, into images. In the PC, this display memory is on a separate circuit board containing the display electronics. Special circuitry is included on this board that prevents the microprocessor and display circuitry from interfering with each other when they access the board to get into the display memory. In the Junior, the display memory is part of RAM. Since RAM's main function is to store information being used by the central processing unit (CPU), when the display circuitry wants to access its memory it is, in a sense, an intruder; each time it accesses RAM, it "steals" a memory cycle away from the CPU, forcing the CPU to temporarily halt its activity and slowing down the Junior's over-all processing time.

While the PC*jr*'s display circuitry does steal memory time away from the CPU, neither it nor the display memory, which takes up 16K of RAM's storage space, are truly unwelcome guests. Both play a big part in giving the Junior its excellent graphics capabilities, including up to 16 medium and four high resolution colors plus six diffrent text and graphic modes. In practical terms, the location of the display memory in RAM is not much of a setback. For instance, PEANUT SOLVER wrote a small BASIC program to generate prime numbers:

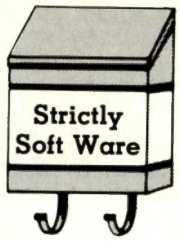
```
 5 TIME$="00:00"
10 DIM A(5000)
20 FOR X=1 TO
5000:A(X)=0:NEXT X
30 FOR X=2 TO 5000
40 IF A(X) THEN 60
50 PRINT X:FOR Y=X TO
5000 STEP X:A(Y)=1:NEXT Y
60 NEXT X
70 PRINT TIME
```

The PC took two minutes and one second to complete the project; PC*jr* took two minutes and fourteen seconds, clocking in at 10.7 percent slower than the PC.

Almost all programs PEANUT SOLVER compared showed the PC*jr* to be no more than this 10 or 11 percent slower, and many times it was only 5 percent slower.

Got a Question?

*PEANUT SOLVER has the answer. This column will tackle any questions about the PC*jr *and personal computing in general, from technical fine points to computer ethics. PEANUT SOLVER also welcomes reader comments. Send questions, comments, and tips to PEANUT SOLVER, PEANUT Magazine, 757 Third Avenue, New York, NY 10017.*





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THE PEANUT GAZETTE

MAY/JUNE 1984 VOL. 1 NO. 1

ON-LINE: FREE FOR THE DIALING

PC*jr* users planning to spend a month in Bangor or Burbank might be interested in the Climate Assessment Data Base, a 24-hour service of the National Meteorological Center in Washington, D.C. According to Systems Analyst Vernon Patterson, "We provide seven-day forecasts of maximum and minimum temperatures, comparisons with the prior year, and heating and cooling 'degree days.' " For further information on using the CAC System, including your own password, call Vernon Patterson or Joanna Dionne at (301) 763-8071.

Is it true that 1985 Cadillacs run on unleaded Perrier? Probably not, but to be sure, check the information provided by the Alternative Fuel Data Bank. According to its manager, Russel Simkis, the system has been designed for direct public access, and provides bibliographies of publications, synopses of ongoing research activities and discussions of energy-related topics. PC*jr* owners with a 300 baud modem can have free access to this database. For instructions on its use, contact Russel Simkis, Alternative Fuel Data Bank, National Institute for Petroleum and Energy Research, P.O. Box 1398, Bartlesville, OK 74005, (918) 336-2400.

"Today is Ladies' Day at the MMMMMM #2!" Sound like a come-on from the local tavern? It's really an on-line ad for the Midtown Manhattan Mixed-Up Matching and Message Machine. An electronic bulletin board listed under the code name "Dial-Your-Mate," MMMMMM#2 offers you the chance to "foster friendships" and be more than just a name. To hook up with the lovelorn, just plug in Junior's modem and dial (212) 541-5975.



Map out your muscle tension and watch yourself relax with this biofeedback system by Synapse (5221 Central Avenue, Richmond, California). Cheaper than a hot tub, *Relax* for the PC*jr* sells for $149.95.

PINK MINK– BUT NOT FOR PEANUTS

"Listen, you never know who's going to want a mink cover," says Patricia Roth, president of 11-month-old Designs in Fabric in Port Washington, New York. While Roth acknowledges that a mink dust cover is an expensive way to keep grit off a computer, her offer to custom-design a fur jacket for Junior is serious. "If you want pink mink with polka-dot silk lining, you can have it," she says.

Relatively speaking, dressing up Junior is a bargain. The PC mink is $1,200; the two-piece Junior cover (one piece for the system unit and one for the keyboard) costs only $850. Designs in Fabric also makes PC*jr* covers for $65 in Ultrasuede (a custom-order in lavender is a distinct possibility, says Roth); Synta-leather ($26); and Suedella ($24). Monograms are $4 extra.

BUT WILL IT GET A DECK CHAIR?

The Queen Elizabeth 2, the ocean liner of distinction, has a new on-board Computer Learning and Adult Electronic Center. Six IBM PC's have already made trans-Atlantic voyages. Now, Cunard Lines Ltd., owner of the QE2, is thinking of putting Peanut next in line for an on-line cruise.

CHRISTMAS IN JULY?



Last December it was clear that IBM was not in a hurry to deliver PC*jr*'s in time for holiday sales. But the Christmas rush couldn't wait. In a come-all-ye-faithful spirit, computer dealers across the country decided to reward those customers willing to put money on machines they might not see till springtime.

A $500 deposit on an absent PC*jr* at ComputerLand of Downtown Boston gave customers a cannister featuring a picture of the PC*jr*. "We wanted people to have something to put under the tree," explains Store Manager R. Charles Gilfix. In a similar symbolic gesture, the ComputerLand of Wichita, Kansas, gave each deposit-paying customer a jar of peanuts topped with a Christmas bouquet.

Tokens, yes, but it was the thought that counted. The CPU Computer Center, a New England chain, put the thought on a T-shirt—"An IBM PC*jr* is Worth Waiting For"—and gave it to anyone who made a 20 percent deposit on the already long-awaited machine.

To promote even further what wasn't there, CPU ran a holiday drawing for a free PC*jr* at each of its 11 stores. While none of the winners received their Peanut giftwrapped in time for Christmas, the winner at the Burlington, Massachusetts, CPU came about as close as anyone. His winning entry form was picked from a PC*jr* box.

But while the PC*jr* was late in coming, most believed in the promise of deliveries in the first quarter of 1984. For instance, Compushop, a chain of 39 stores located primarily in the South and Southwest, showed great faith in Junior's eventual appearance when it ran a two-for-one holiday advertising campaign: "Free IBM PC*jr* When You Buy an IBM Personal Computer."

But perhaps the greatest act of faith was shown by ComputerLand of White Plains, New York. Its PC*jr* gift certificates were signed, in red, "Santa's helper."

KNOWING WHICH BUTTONS TO PUSH

A new book titled *How to Make Love to a Computer* gives new meaning to the term, "user-friendly." Dr. Maurice K. Byte, acclaimed author of *The Byte Report*, and a leading computer sexologist, guides the reader through "the incredible delights of love between man and machine." With information on what distinguishes a lover from a mere user, advice on the special needs of a word processor, and a "Dear Dr. Byte" column, this book just might contain everything you always wanted to know about computers and sex but were afraid to ask.

This paperback from Pocket Books is available at bookstores for $3.95.

5,000 YEARS WORTH OF INPUT

"There is nothing new under the sun," according to the Bible, but Rachelle Heller and Dianne Martin have drawn on ancient tradition to teach BASIC to children ages eight and up. *Alef Basic: A Guide to BASIC Computer Programming with Facts and Fun from Jewish Tradition* offers more than 60 programs usable on the PC*jr*. Bible adventures and holiday games have been designed to build computer skills as well as a knowledge of Jewish history and ritual. The $5.95, spiral-bound book is available from Kar-Ben Copies, 11216 Empire Lane, Rockville, MD 20852. (Yes, the programs do read from left to right.)

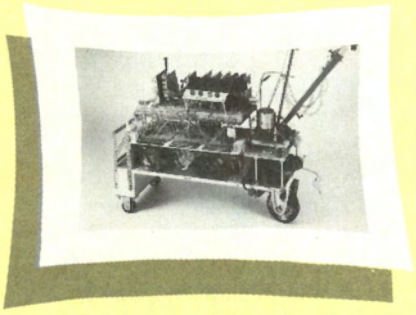
The Davka Corporation has the same idea in the software department, with a Samson and Delilah arcade-style game newly available for the PC*jr*. Attacking Philistines are just as wily as Space Invaders once this game gets going. For more information contact Davka Corp., 845 N. Michigan Ave., Chicago, IL 60611.

JUNIOR'S FAVORITE BARS

Bar codes—those small oblongs of black and white stripes seen on magazines and packaged goods—can be used to feed information directly into home computers. The Databar Corporation publishes a variety of programs for the PC*jr* written in the form of bar codes, which can be read by OSCAR, a bar code reader priced at $59.95 that's also a Databar product. Programs are printed in DATABAR, a monthly magazine ($120.00 per year), and are also available individually for $9.95. The Databar Corporation can be contacted at 10202 Crosstown Circle, Eden Ferry, MN 55344.

As the bar code reader becomes a common peripheral for computer users, both newspapers and magazines may include code information. Soon, it may be possible to shop electronically by brushing a bar code reader over a newspaper ad.

WILL IT DO WINDOWS?



The one and only TAPCAR-1 (Tone Activated Program Controlled Robot) was born in 1975 in New York City. "Nothing works remotely like this machine," says Jonathan Kaplan, who invented TAPCAR-1 at the age of 14. Kaplan crafted the robot from wood, metal, plexiglass, and parts he found in junk piles, surplus electronic stores, "and lots of other odd places." When its batteries are fresh, TAPCAR-1 will fetch a bottle, and shake a drink or someone's hand, depending on which of the three notes Kaplan serenades it with.

While Kaplan, 22, is currently attending the Massachusetts Institute of Technology studying artificial intelligence, his music-appreciating robot has come out of the attic to join other working robots and machine memorabilia that make up *The Robot Exhibit: History, Fantasy, and Reality*. The 160 robots and robot images are featured at the American Craft Museum in New York City through May 12; they'll then take off on a three-year tour of the country.

NAUGHTY AND BAUDY

When Junior needs a spanking, there's always the Byte Bat, a foam rubber bat that comes with its own user's guide. This "user bruiser system" is available for $9.95 from Micro Goodies, Inc., of Princeton, New Jersey. Also included in its catalog are milk chocolate diskettes (eight ounces for $12.29) and, no kidding, "I'm hot for your baud" T-shirts ($10.95 each).

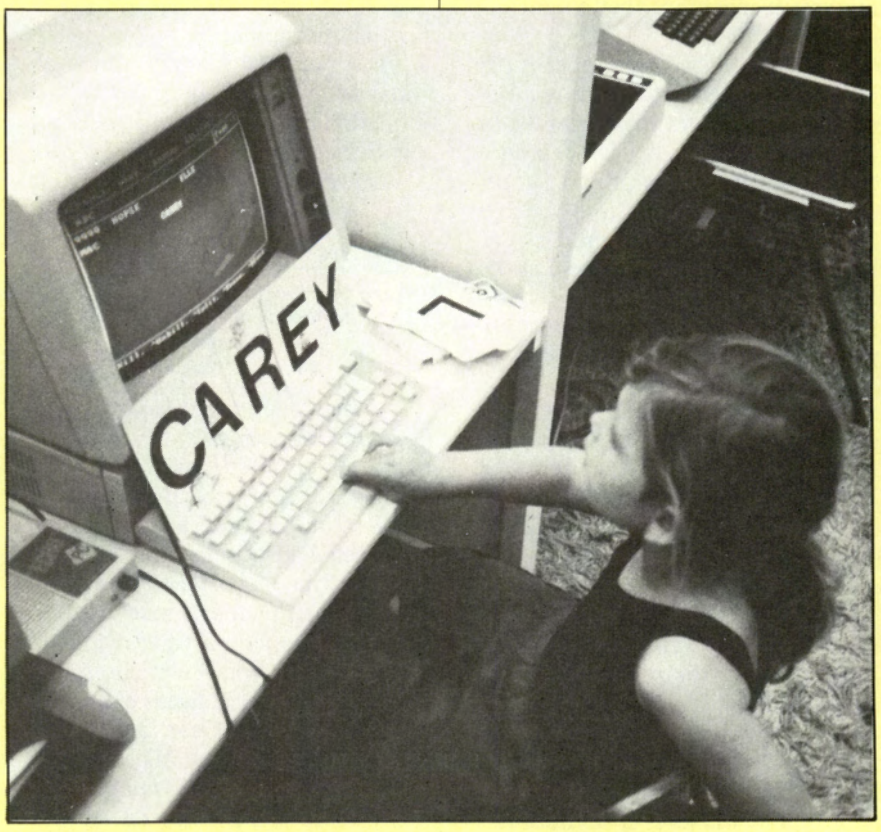
TALKING SCREEN TEACHES READING

After a year of working with 120 children at her lab at Arizona State University, Dr. Terri Rosegrant is convinced that her word processing program not only helps children learn to write, but it also helps them learn to read. Echo II speech synthesizers attached to Rosegrant's IBM PC's, PC*jr*'s, and Apple II's team up with her software, the *Talking Screen Text Writing Program*, to allow children to turn their written language back into the oral language that inspired it. The kids learn to quickly recognize the written words that stand for the sounds they already know.

"Normally, when you are learning to read, you get very little help auditorially," says Rosegrant. "If you don't remember a word you might ask your mom or teacher one or two times, but you wouldn't ask 13 times." The *Talking Screen* program will read anything shown on the computer's screen as many times as a child wants, lighting up each word as it goes. It will also print out lines and pages any time the child requests.

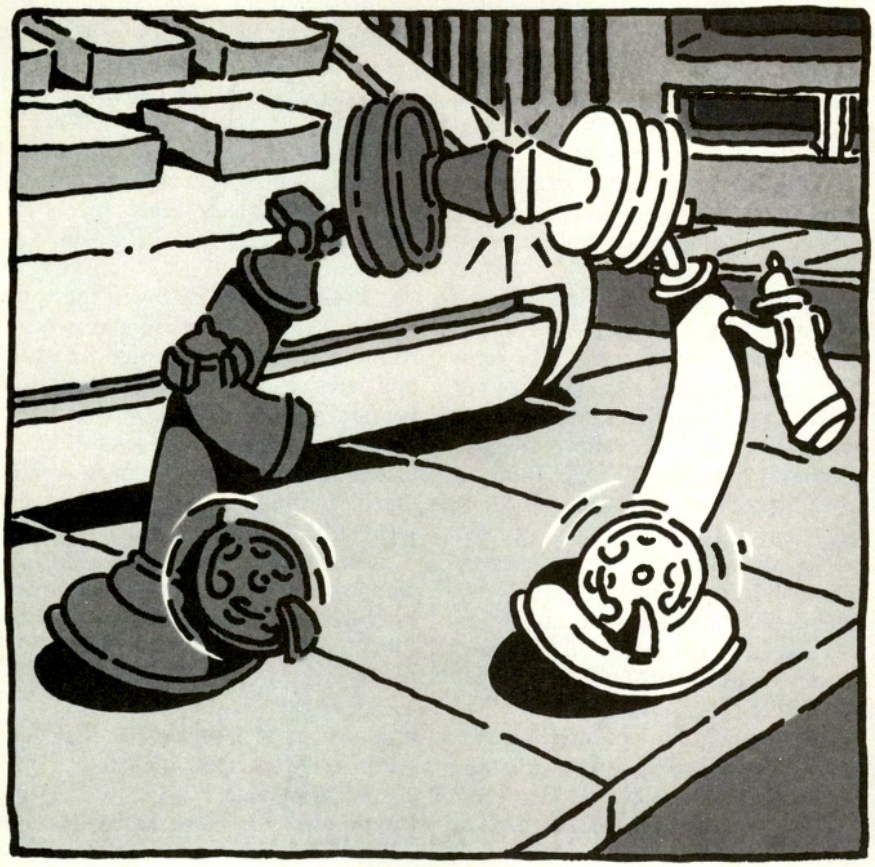
The *Talking Screen* "puts kids in control for a change," explains Rosegrant. "It's not like computer assisted instruction where you've got to wait for the next move by the computer." The 3 to 14 year olds in her lab are very much in charge. They tell the computer what to do—when to read, and what color the text, background, and highlights should be.

Parents are welcome in Rosegrant's lab, and working with their children really pays off. When they first come in, parents tend to wonder, "Can computers help with reading and writing?" "They know after a few sessions," says Rosegrant, "the answer is obviously yes."



PEANUT wants to hear from you. Send us your computer tips and short news items about people who use the PCjr. We pay $25 for each submission published in Peanut Gazette. Write to Peanut Gazette, 757 Third Avenue, New York, NY 10017.

TELECOMPUTING



PETER ROSS

Join Junior and Your Phone - Dial for Information on Demand

BY HOWARD KARTEN

Welcome to the world of telecomputing! With a minimum of additional hardware and software for your PC*jr*, a telephone, and subscriptions to the appropriate services, you have an incredible wealth of resources at your fingertips. You can reach out and touch people, machines, and resources literally around the world. The range of products and services you can access is enormous. Knowing what they are, and what they can do for you, can increase your productivity on the job, make your personal life easier, leisure time more enjoyable, and your shopping almost effortless.

And since the computers on the other end are not programmed to notice who's using them, ordinary users are on an equal footing with those working for the world's largest, richest businesses.

Once you sample the power of telecommunications, you'll make Junior the one member of the family with permission to tie up the phone lines.

What are some of these services? Broadly speaking, they fall into these categories:

Database access. Major corporations around the world, as well as scholars, hobbyists, and others, have invested enormous sums to develop and maintain computerized databases. If you've ever spent time searching for information in the library, you'll be happy to know that there is a computerized database to meet almost any need—and they're open even when the library isn't.

Do you want information about mining activities in Canada? The Mining Technology database has approximately 27,000 entries, going back ten years, covering many aspects of Canadian mining.

Need to find recent articles that have been written about computer printers? The Dialog Computer Database will provide a list of 995 articles catalogued under "Printers." You can get the title of the article, author's name, publication, synopsis, and so on. For an additional charge, you can even arrange—electronically—for Dialog to send you complete copies of the articles.

At latest count, there were more than 2,000 databases available, covering topics from Accidents to Zipcodes, with more coming into existence every day.

Electronic mail. If you've ever played "telephone tag"—trying to deliver a message to someone, and continually finding they're not reachable by phone—you'll appreciate electronic mail, which allows you to leave printed messages for other people (or groups of people), who can then retrieve their messages at any hour, from any place. Electronic mail is also a boon for those who do a lot of travelling, but want to stay in touch with others.

Electronic mail can be helpful if you ever have to get text to someone in a hurry. Even the fastest courier services require overnight delivery.

International electronic mail. The next time you vacation on a remote South Pacific island, where cablegrams back to your home town cost just slightly less than a Maserati, you might want to take your PC*jr* along to help you stay in touch with

the office while you're gone.

With a modem and an account with an international record carrier such as RCA Global Communications, you can sit down at your PC*jr* and fire off a memo whenever the urge strikes you.

Typesetting. You want to get 100 copies of your resume made up, with typesetting instead of typewriter type, and in a hurry. No problem: growing numbers of print shops can accept information sent directly from your computer. This saves on typesetting charges, cuts down on errors, and can cut turnaround time way down. And it's not limited to resumes—you can handle newsletters, pamphlets, even whole books this way.

Meeting people. There's a vast, semi-underground network of people around the country who talk regularly with each other by computer. Groups with common interests, called SIGs (Special Interest Groups), have national bulletin boards where information of interest to members is exchanged. There's a SIG covering virtually every interest, hobby, or occupation.

Friday and Saturday nights can be particularly busy on the CB simulators offered on some consumer electronic services, with the electronic signals flying fast and furiously. Several marriages have even resulted from people "meeting" over these networks.

Education. Several well-known companies have sunk considerable sums into developing educational services available by computer. Probably the best-known of these is Control Data Corporation, a Minneapolis-based firm (best known for its supercomputers) that's spent an estimated $1 billion to develop Plato and Plato Homelink. Although Plato Homelink is currently available on IBM PCs only, it should be available to PC*jr* owners later this year. At latest count, Homelink offered more than 250 courses in academic areas such as medicine, business, and mathematics. Homelink courses can teach you Spanish or French and challenge children with educational discovery games.

Bulletin boards. The electronic bulletin board service (BBS) is the electronic analog of a regular bulletin board, such as you might find in a supermarket or dormitory. There's one exception—no one can take your message down or put graffiti on it, and it's certain to be seen by more people. There are literally thousands of active BBSs ready and waiting for you. Some of them list product reviews, programming tips, and computer world gossip for users of a specific computer. (We'll keep you informed about new PC*jr* bulletin boards as they are born.)

Electronic shopping. Don't care to go out and fight traffic, surly sales clerks and crowded stores? Try electronic shopping—quick, never out of date, convenient. One such service, called Comp-U-Store, allows users to shop electronically for everything from food to clothes. Charges for browsing in these electronic aisles range from $5 an hour in the evening to $18 an hour during business hours. The service is available from Comp-U-Card International, 777 Summer Street, Stamford, CT 06901; (800) 843-7777.

Airline, motel, and hotel reservations. Most large travel-related organizations have 800 (WATS) telephone numbers that can be called toll-free. What to do when you get an urge to travel at 4 a.m. and the 800 numbers aren't answering? Easy. Get onto your computer, examine what flights are available, and book a seat yourself. CompuServe and The Source, information retrieval services that offer a wide variety of databases, are just two of the many services that allow users to access airline schedules electronically.

Banking. More and more people are taking care of routine banking needs by home computer. Want to transfer money from one account to another? Or check your current balance? With electronic banking, your account—and your banker—are only a phone call away.

Media conversion. Suppose there's some information you'd like to have on one of your own disks, but this information (business form letters, lists of names and addresses, etc.) is available only on the disks of another brand computer. The solution? Get someone who has that brand computer, and a modem, to transmit the information to you electronically. You'll be able to capture it on your own disks, without having had to type it all in manually.

Interactive games. Video game junkies who've grown tired of playing against a computer, and who want to play sophisticated computer games against human opponents, can sign onto one of the many games on CompuServe, such as Space War, a game that tests your battle tactics skills. You play this game in "real time," which means both players see each other's moves at the same instant on their screens.

Newsletters. Can't wait for your weekly newsmagazine to arrive on Monday? Want to try a sample issue of a newsletter with which you're not yet familiar? Newsnet, covering more than 160 newsletters in over 40 subject areas, allows you to browse and sample without committing to a long-term subscription.

Electronic yellow pages. Do you want to locate a veterinarian in a town on the other side of the country—but don't have the Yellow Pages directory for that area? Consult the Electronic Yellow Pages, a compendium of 4,000 separate local yellow pages directories. The latest edition, which costs $60 per hour to use, lists approximately 17,800 veterinarians and 270,000 physicians. There are listings for virtually every profession and business.

Health care. Computer programs are now available in specialized areas of medicine that equal the most skilled diagnosticians. Although these are not yet in consumer use, the marketplace is such that it's only a matter of time before they are available to microcomputer users. The technology to make such services available to individuals is in place. These services will bring diagnostic medicine (but not, of course, treatment) to even the most remote or rural areas of the country, improving the nation's health care and possibly saving lives by diagnosing some of the obscure diseases that most physicians don't see in a lifetime of practice.

SET UP A STARTER SYSTEM

What do you need to do the things earlier discussed? Basically, you'll require four items:

1. Your PC*jr*, equipped with a communications adapter.

2. A 300 or 1200 baud modem. A modem (short for MOdulator-DEModulator) is a device that changes information from a computer into a form that can be transmitted over

phone lines. A modem's baud rate refers to the speed at which a modem sends information through the telephone lines. The PCjr internal modem from IBM is a relatively slow 300 baud modem. You can also use a modem made by a different company by connecting it through the Junior's serial port.

3. Communications software. The communications software offered by IBM for the PCjr is called Personal Communications Manager. This program gives you control of the modem and the Junior's data communications functions directly from the keyboard.

4. The telephone number of the service.

A fifth item should be added to the list—some spare cash. Obviously, all of this time on the phone lines costs money. Most of the electronic information services charge a one-time sign up fee ($25 to $100 is the normal range) and then you pay for the time you use each service, either by the minute or by the hour. These on-line fees vary greatly, from $5 to $100 an hour, depending upon the time of day you dial and the specific database you access.

This column will help users get the most out of their hardware, software, and subscription services. From time to to time the column will be turned over to reader queries, complaints and quandries. Communication is at its best when it's a two-way process, so send in your questions and notes of general interest. Send questions and comments to PEANUT Magazine, 757 Third Avenue, New York, NY 10017. If you wish to call on Karten electronically, he can be reached on CompuServe at 70465,1171.

Howard Karten lives, writes, and browses on-line in a suburb of Boston. A former programmer and systems analyst, Karten traces his interest in telecommunications to a childhood practice of intentionally dialing wrong numbers, which taught him the amusement potential of the telephone. He looks forward to the day everyone works at home with a computer and modem and the roads are free of Massachusetts drivers.

A SAMPLER OF ELECTRONIC INFORMATION SERVICES

Once you have the proper equipment for telecommunicating, you can get started on your own simply by calling or writing one of the electronic information services listed below. They will send you a complete list of their services and fees.

New electronic information delivery and retrieval services start up every week. The firms listed here are among the largest vendors. This is by no means a complete list of electronic services available.

Other companies and their databases or other services will be added in future issues.

DATABASE SERVICES

Dialog Information Services, Inc., 3460 Hillview Ave., Palo Alto, CA 94304; (415) 858-2700; (800) 227-1960. Dialog is a service that provides access to more than 180 distinct databases covering almost every area of life including agriculture, business, and conference proceedings. Additions are made each month. Dialog does not charge a start-up fee, but a $135 training course is recommended. Hourly on-line charges depend on the database used.

Bibliographic Retrieval Services, Inc., 1200 Route 7, Latham, NY 12110; (800) 833-4707; (518) 783-1161. BRS, with 80 databases, is quite similar to Dialog. The BRS sign-up fee is $50, and hourly access fees vary from one database to another. BRS Afterdark is an "after hours" service with considerably lower charges.

Dow Jones & Co., Inc., Box 300, Princeton, NJ 08540; (800) 257-5114; (609) 452-1511. Dow Jones specializes in financially-related information. Need a quote on Diversified United Widgets? Dow has it. Want to take a look at the company's 10-K form? It's there, too, along with general financial news, movie reviews, articles from Barrons and other publications, and other information. The Dow Jones database is a collection of 25 separate database services, each with its own fee rates. A $75 startup fee gives you a password that allows you to access any of the services. Weekday "on line" rates run from 60 cents to $1.20 per minute. Evening and weekend rates range from 20 to 90 cents.

INTERNATIONAL COMMUNICATIONS SERVICES

Several U.S. companies offer the ability to send telex messages worldwide from your PCjr—but you must first have established an account. The industry leaders are:

Consortium Communications International, Inc., 80 Broad St., New York, NY 10004; (800) 221-3737; (212) 363-3700.

Graphic Scanning Corp., 329 Alfred Ave., Teaneck, NJ 07666; (201) 837-5100; (800) 336-3729.

ITT World Communications, Inc., 67 Broad St., New York, NY (212) 797-3300; (800) 424-1170.

RCA Global Communications, Inc., 60 Broad St., New York, NY (212) 806-7000; (800) 526-3881.

Western Union Telegraph Co., One Lake Street, Upper Saddle River, NJ 07458; (201) 825-5000.

GENERAL CONSUMER SERVICES

The two largest general-purpose consumer services that have received the greatest amount of coverage are The Source and CompuServe. Both offer a wide variety of services, such as bulletin boards, databases, electronic mail and electronic shopping.

CompuServe, Inc., 5000 Arlington Centre Blvd., Box 20212, Columbus, OH 43220; (614) 457-8600; (800) 848-8199. A starter kit with CompuServe costs $39.95 and includes a one-time subscribers' fee and five hours of "on-line" time. Average hourly access rates are $22.50 per hour from 6 a.m. to 8 p.m. and $6 an hour after 8 p.m. and before 6 a.m.

The Source, Source Telecomputing Corp., 1616 Anderson Road, McLean, VA 22102; (800) 336-3366; (703) 734-7500. The Source charges $100 to sign up and $20.75 per hour of on-line time from 7 a.m. to 6 p.m. Their nightime charge is $7.75 an hour.

Make Your Peanut Sing

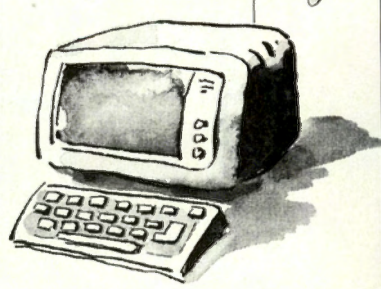
It may not be Mozart, but Junior's music skills are advanced by home computer standards. Try this guide to making Junior a melodious micro.

BY SANDRA MARKLE

Can you remember the last time your family got together to share an activity? No, you can't count breakfast. Chewing in unison is not the same as a family activity. Your clan can find adventure and entertainment tonight while exploring the musical powers of your PC*jr*. Don't leave anyone out even if they aren't yet well acquainted with BASIC commands and programming skills. Writing music for the PC*jr* demonstrates BASIC programming structure and the quick rewards can be music to a learner's ears.

Before you start, it's important to understand what sound is and how Junior creates its pure tones. To you, sound is air molecules vibrating in waves. Each sound is made up of frequency and duration. Frequency is the number of vibrating wave cycles per second. The more cycles the higher the sound. Duration is the fraction of a second that the vibrations last. To Junior, sound is all numbers. Middle C, for example, has a frequency of 523 cycles per second. If on command, Junior sends electrical impulses to its built-in speaker to produce vibrations at this rate, you hear middle C. How long Junior continues to send electrical signals at this rate depends on a second command number that controls the duration of the vibration.

Have someone type in the command BEEP and press ENTER. This command can be used to make Junior produce an automatic sound of a set frequency and duration. You can add it to your programs anytime you'd like a little sound effect for emphasis. Then have someone type SOUND 523,1 and press ENTER. The tone you heard was middle C. Didn't last very long, did it? Now type in SOUND 523,10 and press ENTER. The tone lingered longer this time. The first number in the SOUND command sets the frequency. The second controls the duration. Take turns. Try giving the SOUND command with different frequencies and durations. Don't



The PLAY command in BASIC makes creating music with Junior easy.

forget, if you get a sound that is just noise to your ears, you can stop it. Press the FN key and while holding it down press the BREAK key. Can Junior generate frequencies as great as 32767? It can, but you won't be able to hear it unless you're a bat. And be careful; with just the right frequency, you might attract all the neighborhood dogs.

You can play music using a SOUND command statement for each note, but that would require checking a frequency chart for the note's value. Then you would still have to figure out the duration for each tone as it fits that particular piece of music. Fortunately, thanks to Junior's cartridge BASIC, you can use a PLAY command that makes creating music as easy as "uh-one-and-uh-two-and-uh-three-and."

Have someone type in PLAY "*CDEFGAB*" and press ENTER. What you heard was as if you had played the white keys for the octave from middle C to the C above on a piano. Junior has a set of instructions supplied by BASIC that are followed unless the computer is instructed otherwise. Any built-in instruction, such as generating notes in the middle C octave, is called the *default*. The frequency for each C approximately doubles from octave to octave from O0 (the lowest C on the piano) to O6 (the highest C). Notice that the letter symbols that represent the frequency value of the notes have to be surrounded by quotation marks ("). You can make Junior play a note in any octave just by specifying the one you want to hear. Try typing in: PLAY "*O2CDO3EFO1GAO4B*". Press ENTER. Hear the difference?

You can also PLAY sharps and flats—the black keys on a piano. Type in PLAY "*CC#D#EFF#G G#AA#B*" and after you've heard that, type PLAY "*CD-DE-EFG-GA-AB-B*". The pound sign (#) or plus sign (+) can be used to clue Junior that you want to hear a sharp. The minus sign (−) signals a flat. Here is the music for the song "Old Smoky":



And here are the musical notes for the middle C scale.



Notice the middle C is on a special line just below the measure. Any note shown lower than this (such as the first note in "Old Smoky") has to be played an octave lower. Octave 3 is the default so begin writing the PLAY command statement with: PLAY "*O2AA*.... When the notes return to middle C or above, add O3 to get Junior back in that octave. For high C or any note in the high C octave, you would need to indicate O4. You can also use the less than sign (<) to indicate dropping down an octave or a greater than sign (>) to show going up an octave. Two << means a two octave drop.

Sound, you'll remember, always has to include both frequency and duration commands. Your instruction to generate the sound O2A really signalled the computer to produce a sound with a frequency of about 440 cycles per second. The duration is determined by the type of note. The way the note looks is your cue about what number command to put after the note's letter name.

There is no value shown after the quarter note and only a period is used to indicate the dotted quarter note. A quarter note (or 4) is the default that Junior will follow unless instructed otherwise. If the music shows a rest, use the command P (for pause) and a time value in musical beats, such as 1, 4, 8, and so on.

To hear the opening measures of "Old Smoky," you will need to type: PLAY "*O2AAO3C#EA2.F#2*." Try it. Did the music sound a little high-pitched for your liking? Have someone change the O2 to O1 and the O3 to O2. Still not quite right?

Besides frequency and duration, music also has tempo (the speed at which it's played). You'll need two commands to handle this. First, there's MS, ML and MN. MS for *music staccato* makes Junior sound each note in a short, clipped fashion. ML for *music legato* makes Junior hold notes, running them smoothly into each other. MN is *music normal*, the default, and makes Junior generate each sound for seven-eighths of its duration, leaving a tiny break between notes. This is what you've been hearing. Put a 20 in front of your PLAY statement and add a line 10: PLAY "MS". Have someone type in RUN and press ENTER to hear "Old Smoky" in this style. Change MS to ML for a repeat performance. What sounds best?

You'll also need to add a second command, T100, inside the quotes and separated by a space from the MS, ML or MN. This command sets the speed at which Junior plays notes per minute. T100 means that the computer will generate 100 quarter notes per minute or 50 half notes per minute. Take turns experimenting with the tempo. T120 is the default, T32 is the slowest Junior can play and T255 is top speed. Some tempos can make the music sound pretty funny.

Now that you have the hang of it, try to write a program for the rest of "Old Smoky." Work together to write the program—one music line to a command statement—that will make Junior play for you. RUN the program to check yourself or look on page 80. When the music sounds right, play it again.

For the puzzle lovers in your family, here are three mystery music selections to test you. Divide into teams with each team taking on the job of translating the music for at

PC*jr* can play three notes at a time, which allows you to play chords.

least one selection into PLAY programs for Junior. Then try out the results together, changing the music style and tempo from the defaults as needed. Who can name that tune? Check yourself on page 80.

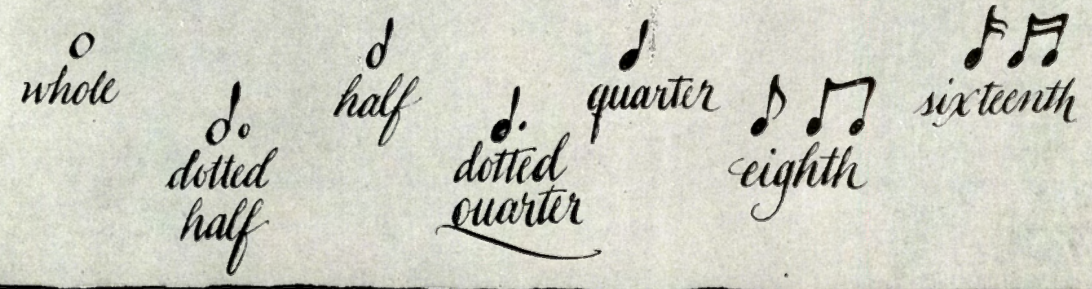
Since you're doing so well, how about a real challenge? Your PCjr has the special ability to play as many as three notes at a time. This allows you to play chords for an organ-like effect. Sound neat? It is, but before you'll be able to hear Junior harmonize, you'll need to hook the computer up to a speaker system other than its built-in one. The computer's speaker doesn't have the range capabilities necessary to generate such varied tones. If you're using a television as a monitor, you're all set. The TV's speakers will work fine. If you're using a monitor, you'll need to connect Junior to a television or to a stereo speaker system. Check your operator's manual for the type of cable you'll need and hook-up directions. It's worth the effort to hear Junior in full-voice.

Once the computer is connected, type the command statement

Mystery Tunes



Note Types





BEEP OFF:SOUND ON. Junior has a special chip, the Texas Instruments SN76489A sound generator, that takes charge of directing signals to the new speaker system and handles tone production. Now type: PLAY *"O2C","O2E", "O1G"*. Each quote-surrounded phrase in one command statement controls a separate voice. You can include more than one note for a voice. In that case the notes are played in order (left to right) for each voice simultaneously. For example: PLAY *"O2E-.D-8C.", "O2C.B-801A-.","O1A-E-A-"*.

Here is a guide to programing the music (with multiple voices) to the "Battle Hymn of the Republic."

To set up a program that will make Junior play this song, you'll first need a command heading:
10 BEEP OFF;SOUND ON
30 PLAY *"MB ML O2 L4 T100 V12","MB ML 02 L4 T100 V12","MB ML 01 L4 T100 V6"*.
Each voice needs its own set of start-up instructions. You already know what ML and T100 stand for. MB means *music background*. This command places each note in a memory buffer allowing the BASIC program to continue executing while the music is playing. Use the volume (V) command to make your melody line stand out. The default is 8 and the top volume level is 15. You may also want to use this command within a line statement to emphasize a particular note. Remember, like changing octaves, the volume remains at any new setting until changed again.

To write the PLAY command for the music shown above, start with the notes for the first voice—the uppermost line of notes. PLAY *"E-8.E-16E-8.E-16E-8.D-16C8.E-16A-8.B-16"*,. Then add the second voice for that same section. To sound right, this voice must PLAY the exact same number of beats per measure as the first voice. If you're in doubt as to how many beats that is, check the "time signature" that appears before each piece of music, such as 2/4, 3/4 or 4/4. The upper number is the number of beats per measure. In the "Battle Hymn of the Republic," there will be four. The beats may be four quarter notes, eight eighth notes, four eighth notes and eight sixteenth notes, or any combination that totals four beats. If that voice doesn't have a note to play, make up the time with a P (pause) for the same duration. The second voice would be: *"P8.P16C8.C16C8. O1B 16A-8.O2C16C8.D-16"*,. The third voice would be *"E-O0A-A- A-A-"*. RUN this short beginning of a program to hear the results.

Then try this second measure on your own. PLAY the program again to check your efforts or look at line 310 in the BATTLE program.

Junior will perform for you, with music and lyrics displayed in brilliant color.

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For a grand finale, type in each of the programs listed below and let Junior perform for you with music and lyrics displayed in brilliant colors. Unless you plan to make arrangements to SAVE your programs on a cassette or a diskette, you'll need to type in and enjoy the songs one at a time. Otherwise, when you type in the second song it will erase the first one. Be very careful when typing in the programs. One small mistake can disrupt the entire program.

Okay, everyone get ready to add your voices to Junior's, but don't sing too loudly. The neighbors will hear what a good time you're having, and they might just come over to join in with the fun.

Sandra Markel is an Atlanta-based freelance writer and a contributing editor to PEANUT. Her published books include Kids' Computer Capers *and* Computer Tutor. *Her latest book,* The Programmer's Guide to the Galaxy, *will be published this fall.*

ANSWERS TO SONGS

OLD SMOKY

NEW
10 PLAY "MN T100"
20 PLAY "O1AAO2C#EA2.F#2.F#"
30 PLAY "DEF#E1.01A"
40 PLAY "AO2C#EE201B2.02C#"
50 PLAY "DC#01BA1."

MYSTERY TUNE NO. 1: I'VE BEEN WORKING ON THE RAILROAD

NEW
10 PLAY "02G.D8G8.D16G8.A16"
20 PLAY "B2G203C.C802GAB2."

MYSTERY TUNE NO. 2: JINGLE BELLS

NEW
10 PLAY "O2D8B8A8G8D."
20 PLAY "D16D16D8B8A8G8E."

MYSTERY TUNE NO. 3: HOME ON THE RANGE

NEW
10 PLAY "MN T100"
20 PLAY "O1A8A8O2D8E8F#"
30 PLAY "D16C#1601B8.02G16G8G"

Programs for an Electronic Sing-Along



BATTLE HYMN OF THE REPUBLIC

```
0 REM Battle.bas, "Battle Hymn of the Re
public in three-part harmony, Markle, 1/
15/84
1 REM Copyright (c) 1984 by CompuQuill
5 GOTO 10
7 SAVE "BATTLE.BAS":END
10 BEEP OFF:SOUND ON' Internal speaker o
ff, external speaker/TV sound on
20 CLS:KEY OFF:COLOR 1,,15:PRINT:PRINT T
AB(6);"BATTLE HYMN OF THE REPUBLIC":PRIN
T:COLOR 4
29 ' Strings to initialize the three voi
ces of the sound chip: Background, Norma
l, Octave, Length, Tempo
30 PLAY "MB MN O2 L4 T100 V12","MB MN O2
 L4 T100 V12","MB MN O1 L4 T100 V6"
99 ' LYRICS
100 PRINT" MINE-EYES HAVE SEEN THE GLO-R
Y OF"
110 PRINT" OF THE COM-ING OF THE LORD; H
E IS"
120 PRINT" TRAMP-LING OUT THE VIN-TAGE W
HERE THE"
130 PRINT" GRAPES OF WRATH ARE STORED; H
E HATH"
140 PRINT" LOOSED THE FATE-FUL LIGHT-NIN
G OF HIS"
150 PRINT" TER-RI-BLE SWIFT SWORD; HIS T
RUTH"
160 PRINT" IS MARCH-ING ON."
170 PRINT:PRINT" GLO--RY, GLO-RY, HAL-LE
-LU  --  JAH!"
180 PRINT" GLO--RY, GLO-RY, HAL-LE-LU  -
-  JAH!"
190 PRINT" GLO--RY, GLO-RY, HAL-LE-LU  -
-  JAH!"
200 PRINT" HIS TRUTH IS MARCH-ING ON."
299 ' VERSE
300 PLAY "E-8.E-16E-8.E-16E-8.D-16C8.E-1
6A-8.B-16>C8.C16C8.<B-16A-A-8.G16","P8.P
16C8.C16C8.<B-16A-8.>C16C8.D-16E-8.E-16E
```

```
-8.D-16CE-8.E-16","E-<A-A-A-A-A-A-A->C"
310 PLAY "F8.F16F8.G16A-8.G16A-8.F16E-8.
F16E-8.C16E-E-8.E-16","D-8.D-16D-8.E-16F
8.E-16F8.D-16C8.D-16C8.<A-16>CP8.P16","D
-D-D-D-<A-A-A->E-"
320 PLAY "E-8.E-16E-8.D-16C8.E-16A-8.B-1
6>C8.C16C8.<B-16A-A-B-B-A-GA-2.","C8.C16
C8.<B-16A-8.>C16C8.D-16E-8.E-16E-8.D-16C
E-D-FE-D-C2.","<A-A-A-A-A-A-A->CD-D-E-<E
-A-2."
399 ' REFRAIN
400 PLAY "E-.D-8C8.E-16A-8.B-16>C2<A-2",
"C.<B-8A-8.>C16C8.D-16E-2C2","<A-E-A-E-A
-E-A->C"
410 PLAY "F.G8A-8.G16A-8.F16E-2C2E-.D-8C
8.E-16A-8.B-16","D-.E-8F8.E-16F8.D-16C2<
A-2>C.<B-8A-8.>C16C8.D-16","D-<A->B-B-<A
-E-A-E-A-E-A-E-"
420 PLAY ">C2<A-A-B-B-A-GA-2.","E-2CE-D-
FE-D-C2.","<A-E-A->CD-D-E-<E-A-2."
500 END
```



DIXIE

```
0 REM DIXIE.BAS, "Dixie" in three-part h
armony, Markle, 1/15/84
1 REM Copyright (c) 1984 by CompuQuill
5 GOTO 10
7 SAVE "DIXIE.BAS":END
10 BEEP OFF:SOUND ON' Internal speaker o
ff, external speaker/TV sound on
20 CLS:KEY OFF:COLOR 4,,7:PRINT:PRINT TA
B(17);"DIXIE":PRINT:COLOR 1
29 ' Strings to initialize the three voi
ces of the sound chip: Background, Legat
o, Octave, Length, Tempo
30 PLAY "MB ML O2 L4 T90 V12","MB ML O1
L4 T90 V8","MB ML O1 L4 T90 V8"
99 ' LYRICS
100 PRINT" I-- WISH I WAS- IN THE"
110 PRINT" LAND OF COT-TON, OLD TIMES TH
ERE ARE"
120 PRINT" NOT FOR-GOT-TEN, LOOK A-WAY,
LOOK A-"
130 PRINT" WAY, LOOK A-WAY, DIX-IE LAND!
"
140 PRINT:PRINT" IN-- DIX-IE LAND- WHERE
-"
150 PRINT" I WAS BORN IN, EAR-LY ON ONE"

160 PRINT" FROST-Y MORN-IN', LOOK A-WAY,
 LOOK A-"
170 PRINT" WAY, LOOK A-WAY, DIX-IE LAND!
"
180 PRINT:PRINT" THEN I WISH I WAS IN DI
X-IE, HOO-"
190 PRINT" RAY, HOO-RAY; IN DIX-IE LAND
I'LL"
200 PRINT" TAKE MY STAND, TO LIVE AND DI
E IN"
210 PRINT" DIX-IE, A-WAY, A-WAY, A-WAY"
220 PRINT" DOWN SOUTH IN DIX-IE,"
230 PRINT" A-WAY, A-WAY, A-WAY,"
240 PRINT" DOWN SOUTH-- IN DIX-IE."
299 ' VERSE
300 PLAY "G16E16C8C8C16D16E16F16","P16P1
6P8G8P8G8","P16P16<C8>E8<G8>E8"
310 PLAY "G8G8G8E8A8A8A8.G16","P8G8P8C8P
8C8P8C8","<C8>E8E8G8F8A8<C8>A8"
320 PLAY "A8.G16A16B16>C16D16E.C16<G16",
"P8C8A8C8P8E8P8E8","F8A8P8P8G8C8G8C8"
330 PLAY ">C.<G16E16G.D16E16CP4","P8C8P8
C8F8G8<G8>F8E8G8<G8","E8G8E8G8F8G8<G8>F8
E8G8<G8"
340 PLAY "G16E16C8C8C16D16E16F16",">G8P8
G8P8G8","P8<C8>E8<G8>E8"
350 PLAY "G8G8G8E8A8A8A8.G16","P8G8P8C8P
8C8P8C8","<C8>E8E8G8F8A8<C8>A8"
360 PLAY "A8.G16A16B16>C16D16E.C16<G16",
"P8C8A8C8P8E8P8E8","F8A8P8P8G8C8G8C8"
370 PLAY ">C.<G16E16G.D16E16CP4","P8C8P8
C8F8G8<G8>F8E8G8<G8","E8G8E8G8F8G8<G8>F8
E8G8<G8"
399 ' REFRAIN
400 PLAY "G16G16>C8E8D8.C16<A8>C<A8","E8
C8G8E8C8F8C8<C8>C8","E8C8E8E8G8F8A8<C8>A
8"
410 PLAY ">D.<A8>D.<G8>C8E8D8.C16","F#8C
8D8C8B8F8E8D8<C8>G8E8C8","F#8A8D8A8G8F8E
8D8<C8>E8E8G8"
420 PLAY "<A8B8>C8.<A16G8E8>C8.<E16E8DE8
","F8C8A8C8G8C8E8C8G8<G8A8B8","F8A8A8C8G
8C8E8G8G8<G8A8B8"
430 PLAY "C.E8D.A8","C8>G8<G8>G8D8G8<G8>
G8","C8>E8<G8>E8D8F8<G8>F8"
440 PLAY "G8E8>C8.E16D8C<E8","<C8>G8<G8>
G8F8E8G8<G8","<C8>E8<G8>E8F8E8G8<G8"
450 PLAY "C.E8D.A8","C8>G8<G8>G8D8G8<G8>
G8","C8>E8<G8>E8D8F8<G8>F8"
460 PLAY "G8E8>EC16D8C","E8G8<C>P16F8E8"
,"E8G8<GP16G8>C8"
500 END
```

Stump the Peanut

Challenge Junior to a game of skill

BY ROSEMARIE GABRIELE

Put your wits each month against the cool logic of your PC*jr*. Challenging Junior to a game of skill is easy: turn on your PC*jr* and wait until the messagee at the top of the screen reads "The IBM Personal Computer BASIC Version C1.20 Copyright IBM Corp. 1981 62940 Bytes free OK." A blinking "dash" should appear just below the "OK." Your PC*jr* is now ready to accept programs written in BASIC.

You must be 100 percent accurate when typing in your program—one misplaced punctuation mark could prevent the program from running properly. If you do make any errors, you can go back and edit the line with the mistake. Program editing is relatively simple and is clearly explained in a booklet you can buy to go with your PC*jr* called *Hands-on BASIC for the IBM* PC*jr*.

Once you have typed in the program, you will probably want to save it on a diskette or a cassette tape. If you don't save your program after you have typed it in, the game will be erased from the PC*jr*'s temporary memory when you turn it off.

This issue's game, an electronic version of a card game, is called "Flash." Conventionally, Flash is played by two people, but today your opponent is the computer. When playing with a person, you use a partial deck of cards (Ace's-6's); the computer edition uses numbers 1-6 in columns and rows. The rules of the game are simple: In turn, each player (you and the computer) selects one of the available numbers from the grid. As a player selects a number it is added to any previous selection by either player. For example, if you choose 6, the cumulative total equals 6. If the computer then chooses 4, the new total equals 10. The first player to reach 31, *without going over* 31, wins the game.

You don't have to know anything about programming to teach Junior to play this game.

The computer is programmed to win, just about every time. Therefore, if you are looking for mathematical intrigue and challenge, do not read the explanation that goes along with each section of the program, but merely type in the program commands, type *RUN* and start play. After you have enjoyed playing the game and figuring it out, refer back to the program explanations where all the secrets of the game are disclosed. But remember, you don't have to know anything about programming in order to teach Junior to play this game. If some of the text is over your head, just skip it and type in the program line for line.

Now, without further ado, enter the program, portion by portion:

```
10 DIM CRD%(5),PLY$(1)
20 PLY$(0)="PLAYER":PLY$(1)="COMPUTER":T
G$=""
30 FOR I= 0 TO 5:CRD%(I)=4:NEXT
40 CNT%=0:CT%=0:CLS
```

Line 10 creates two arrays—CRD% and PLYS$. CRD% is an array assigned to keep track of available moves. CRD%(0) contains the number of available 1's, CRD%(1) contains

The computer is programmed to win, just about every time.

the number of available 2's, and so on. If CRD%(0) has the value 0, than all of the 1's have been used. PLY$ has two elements; each element contains the name of a contestant—PLY$(0) is the computer and PLY$(0) is the opponent. Line 30 assigns the initial value of 4 to each element of array CRD%, while line 40 initializes the count and the variable CT%. CT% keeps track of the computer's turns.

```
50 LOCATE 3,1
60 PRINT "COMPUTER IS READY TO PLAY THE
GAME."
70 PRINT "WOULD YOU LIKE TO PLAY";TG$;
80 INPUT ANS$
90 IF LEFT$(ANS$,1)="N" THEN CLS:PRINT "
OK. LET'S DO IT AGAIN SOMETIME.":END
100 IF LEFT$(ANS$,1)="Y" THEN TG$=" AGAI
N":GOTO 120
110 BEEP:BEEP:BEEP:PRINT "PLEASE ANSWER:
 YES OR NO.":GOTO 50
```

Lines 50-110 determine whether the player wishes to play again or be returned to BASIC.

```
120 SW%=0
130 GOSUB 1000
140 LOCATE 3,1
150 PRINT PLY$(SW%);"'S TURN."
160 ON SW% +1 GOSUB 2000,3000
170 CRD%(PICK%-1)=CRD%(PICK%-1)-1
180 CNT%=CNT%+PICK%
190 IF CNT%=31 GOTO 220
200 IF SW%=0 THEN SW%=1:ELSE SW%=0
210 IF CNT%<31 GOTO 130
220 GOSUB 1000
230 LOCATE 20,1:BEEP:BEEP:BEEP:PRINT PLY
$(SW%);" WINS"
240 FOR I=1 TO 5000:NEXT:GOTO 30
```

Statement 120 initially sets a variable (SW%) with a value of 0—player goes first. The variable SW% contains one of two values, (0 or 1); 0 indicates the player's turn, 1 indicates the computer's turn.

Statement 130 calls subroutine 1000 into the picture; it draws the screen (pun intended). Statement 150 displays the designated player; 160 uses the value of SW% to branch to subroutine 2000 or 3000, depending upon who has the next move. If SW%=0, the program branches to subroutine 2000 (player), if SW%=1, the program branches to subroutine 3000 (computer).

When the subroutine for the player's or computer's move returns, the move taken is in variable PICK%. Statement 170 updates array CRD% to remove the number just played. Statement 180 increases the accumulative count by the number played; 190 checks the count to see if the last player won by reaching 31. Line 200 changes the value of SW%. Line 210 takes care of the next possibility; it checks to see if the game should continue. If the program gets to line 220, the last move went over 31 and line 230 displays the winner. Statement 240 checks to see if you want to play again.

Subroutine 1000:

```
1000 CLS:LOCATE 8,1
1010 FOR I=5 TO 0 STEP -1
1020 IF CRD%(I)=0 GOTO 1040
1030 LOCATE ,15: FOR J=1 TO CRD%(I):PRIN
T I+1;" ";:NEXT
1040 PRINT
1050 NEXT
1060 LOCATE 15,20
1070 PRINT "COUNT= ";CNT%
1080 RETURN
```

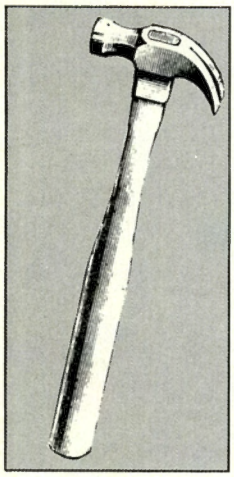
The function of this subroutine is to display all available numbers along with the current accumulative count. Line 1000 clears the screen and positions the cursor. Lines 1010-1050 make up a FOR/NEXT loop that examines each element of the CRD% array, descending from (5) to (0), representing numbers 6-1 respectively. Statement 1020 skips an output line if an element of CRD% has a value of 0. An element with a value of 0 means the corresponding number is no longer available since all four of that particular number were already chosen. Another FOR/NEXT loop is used in 1030, which prints the appropriate number as many times as indicated by the value of the corresponding element of CRD%. For instance, the number of 3's left to play is indicated by the value of CRD% (2). 1070 displays the correct value of the count.

Subroutine 2000:

```
2000 LOCATE 3,24
2010 INPUT PICK%
2020 IF PICK%<1 OR PICK%>6 THEN LOCATE 2
2,1:PRINT "ILLEGAL MOVE!": GOTO 2060
2030 IF CRD%(PICK%-1)>0 THEN RETURN
2040 LOCATE 22,1
2050 PRINT "SORRY. NO MORE ";PICK%;"'S L
```

Line 3010 of the program foils the hot-shot who's on the verge of discovering the game's strategy.

Your ultimate advantage



```
EFT. HA! HA! HA!"
2060 BEEP:BEEP:BEEP:PRINT "PLEASE TAKE Y
OUR TURN AGAIN.":GOTO 2000
```

This subroutine's function is to input the player's moves. Statement 2010 is an INPUT statement. It inputs a player's move into PICK%, while 2020 checks to ensure that the number is in the allowable range (1-6). If the value of PICK% is out of range, a message is written and a branch to a common error statement is executed. Statement 2030 checks if the player chose an available number. If the number is not available, CRD%( )=0, a message is printed. Statement 2060 displays a message for the players to take the turn over due to an invalid entry, and then branches back to 2000; 2030 returns to the main program.

Subroutine 3000:

```
3000 CT%=CT%+1
3010 IF CNT%=7*CT%-4 THEN PICK%=4:GOTO 3
090
3020 GOAL%=31
3030 DFF%=GOAL%-CNT%
3040 IF DFF%>6 THEN GOAL%=GOAL%-7:GOTO 3
030
3050 IF CRD%(DFF%-1)>0 THEN PICK%=DFF%:
GOTO 3090
3060 FOR J=5 TO 0 STEP-1
3070 IF CRD%(J)<>0 THEN PICK%=J+1
3080 NEXT
```

This series is concerned with the computer's moves. In line 3000, CT% keeps count of the computer's turns. Line 3010 is there for the hot-shot, who, in a flash of insight, thinks he's discovered the strategy. Thus, 3010 is a special defense against a player's choosing the number 3 in his first four moves. If the player starts with 3 and continues choosing 3's, the program dictates that the computer choose 4's. With this strategy, the player is "suckered" into believing he's going to win, as he reaches the target numbers of 3, 10, 17, and 24. But the player eventually runs out of 3's, making it impossible to reach 31.

Statements 3020-3050 contain the strategy of the game, which is seeking the target numbers of 3, 10, 17, 24, and, of course, 31. More specifically, 3020 sets the goal of 31, 3030 calculates the difference between the goal and the current count, 3040 states that if the difference is less than 6 then the goal is reachable in this turn; if not, the goal is adjusted. In this manner the goal for a turn changes from 31 to 3 in decrements of 7 (31, 24, 17, 10, 3) until the goal that is reachable for that turn is established.

By the time the program reaches 3050, the goal has been established and the value of DFF% is the number the computer wishes to play. Statement 3050 checks to see if this number is available. If it is, the value is assigned to PICK%. Statements 3060-3080 are executed when the number the computer wishes to play is not available. These statements select the lowest possible number available to play. Before returning to the main program there are some human factors to consider.

Human factor statements:

```
3090 FOR I=1 TO 2000:NEXT
3100 LOCATE 17,25 :BEEP:BEEP:BEEP:PRINT
"COMPUTER TAKES ";PICK%
3110 FOR I=1 TO 2500:NEXT
3120 RETURN
```

3090 delays to make it appear that the computer is thinking; 3100 displays the computer's move; 3110 delays to give the player time to assimilate the computer's move; 3120 returns to the main routine.

Now you are ready to stump (or be stumped by) the Peanut. Just type *RUN* and the computer will take it from there. If you type in an answer that the program can't accept, you will usually be asked to try again. If you get totally frustrated with being beaten by a machine and start pounding on the keyboard (don't laugh until you've tried this game a few times) you might wind up "outside" the program. Simply type *RUN* again and the game will start over. Good luck!

Rosemarie Gabriele owns Personal Computer Training, a Stamford, Connecticut-based computer training institute. She and her husband, Peter, are authors of Game Techniques in Apple Soft BASIC.

PEANUT Post-It Program

AN ORIGINAL CLIP-AND-SAVE PROGRAM TO TRY EVERY MONTH

THE PCjr POSTAGE METER

In every issue of PEANUT you'll find a short program that's easy to type in and run. This month's Post-It program—the *PCjr Postage Meter* (no pun intended; Post-It programs to come will help you with a lot more than your mail)—can save you time, money, and hassle.

Unless you mail hundreds of letters a year, you probably don't have a postage scale in easy reach. What do you do when you have to stuff more than a page or two into an envelope? Do you guess and hope that you put on enough stamps? Or do you make the trip to the post office and stand in line to have your letter weighed? The *PCjr Postage Meter* can save you this trouble. Type in BASIC commands, then type RUN. Junior asks you the bond weight of the paper you're using; the number of pages; and the type of envelope. Type in your answers and the PCjr computes and displays the correct postage.

Line 100 clears the screen. Line 110 selects large character graphics and line 120 sets the line width at 40 characters.

```
100 CLS
110 SCREEN 0,1
120 WIDTH 40
```

Lines 130 through 210 format and display the program title, and the prompt requesting the paper's weight.

```
130 LOCATE 2,5
140 PRINT "postal scale"
150 PRINT
160 PRINT "bond weight"
170 PRINT
180 PRINT "1. 16 pound paper"
190 PRINT
200 PRINT "2. 20 pound paper"
210 PRINT
```

Line 220 stores the paper's weight in the numeric variable BOND. Lines 230 and 240 figure the weight per sheet of paper and store it in the numeric variable WEIGHT. Line 245 allows you to enter only a "1" or "2."

```
220 INPUT BOND
230 IF BOND = 1 THEN WEIGHT = .128
240 IF BOND = 2 THEN WEIGHT = .16
245 IF BOND > 2 THEN GOTO 220
```

Line 250 displays a blank line. Line 260 asks how many sheets of paper you plan on mailing and stores the reply in the numeric variable NUMBER.

```
250 PRINT
260 PRINT "sheets mailed";:INPUT NUMBER
```

Line 270 calculates the weight of the paper, by multiplying the weight of one sheet times the number to be mailed.

```
270 WEIGHT = NUMBER * WEIGHT
```

Lines 280 through 340 display the prompt that asks what kind of envelope you'll be using.

```
280 PRINT
290 PRINT SPC(5) "mailer size"
300 PRINT
310 PRINT "1. business size"
320 PRINT
330 PRINT "2. manilla envelope"
340 PRINT
```

Line 350 gets the reply and stores it in the numeric variable ENVELOPE. Lines 360 and 370 store the chosen weight in the numeric variable ADD.

If you routinely send off those big padded mailers, weigh the different sizes and add a line to include them as an option. Line 375 allows you to enter only a "1" or a "2."

```
350 INPUT ENVELOPE
360 IF ENVELOPE = 1 THEN ADD = .16
370 IF ENVELOPE = 2 THEN ADD = 1
375 IF ENVELOPE > 2 THEN GOTO 350
```

Line 380 figures the total weight.

```
380 WEIGHT = WEIGHT + ADD
```

Line 390 figures out how many ounces will be mailed. Remember that the U.S. Postal Service rolls over any portion of an ounce to the next full ounce. For example, in its hands, both 4.1 and 4.9 ounces equal 5 ounces. Line 390 does some calculating to roll over any portion of an ounce to the next full ounce.

```
390 IF WEIGHT - INT(WEIGHT) > 0 THEN WEI
GHT = INT(WEIGHT) + 1
```

Line 400 charges 20 cents the first ounce and 17 cents for each additional ounce. (20 cents is the decimal .20.) Remember to update the numbers in line 400 as postage rates increase.

```
400 STAMPS = ((WEIGHT -1) * .17) + .2
```

Lines 410 and 420 display the required postage. Line 430 waits for a keystroke. Type RUN to run the program again.

```
410 PRINT
420 PRINT "postage due $";STAMPS
430 A$ = INKEY$: IF A$ = "" THEN 430: GO
TO 100
```

Timothy P. Banse is a contributing editor to PEANUT. His latest book is *Home Applications and Games for the PC/PCjr.*

Is Junior Ready for a Corner Office?



LLYNNE BUSCHMAN

BY SHARON EFROYMSON AND RAYMOND HOOD

Ever since the launch of the IBM PC*jr*, industry observers have speculated on the little machine's ability to make it in the big world of business. Could Junior take its rightful place next to its bigger brothers, the IBM PC and XT? Or might Junior actually take their place? Would a cluster of Juniors, wired together and sharing a hard disk, provide a small or medium size business with adequate computing power?

And what about the notion that the Junior would become the new executive perk? That managers who use a PC all day at work would be given a Junior on which to continue toiling at night?

Would MIS directors snicker at the lightweight keyboard? Would captains of industry even consider having something called "Junior" on their desks? Does the Peanut really mean business?

As consultants to major corporations, who have trained hundreds of business people to use the IBM PC in their work, it was in our best interest to answer these questions. Let's take a look at the Peanut's potential in the workplace.

First, we agree that the PC*jr* provides a tempting lure to the business person. With the enhanced model priced at a mere $1,300, Junior sports the stamp of IBM quality at about half the cost of the IBM PC.

Many potential purchasers are considering the PC*jr* as an alternative or adjunct to the PC, which is considered the industry standard. Although the PC*jr* doesn't challenge the PC in its capabilities, it's certainly more than a match for others in its category, such as Apple or Atari. Junior's more powerful microprocessor, for example, will allow it to operate at a faster rate and eventually support much more memory.

A wise business person, however, won't sacrifice capability for the sake of cost. If the PC*jr* doesn't fulfill a manag-



Can Junior use its big brother's business software? Our overall results were heartening.

er's needs, then an expenditure of $1,300 is no bargain—it's a loss.

The PC*jr* must be able to support the hardware and software necessary to perform the following operations on a relatively sophisticated level:

- word processing;
- spreadsheet analysis;
- data management; and
- accounting.

For serious business use, only the enhanced version, with 128K RAM and disk drive, can be considered as a viable stand-alone computer.

After the initial joy at Junior's birth, early grumblings centered on the keyboard. Those expecting the PC's typewriter-style keyboard were disappointed. A typical reaction to the PC*jr* was expressed by Robert Evans, a programmer working for Timis Corporation of Chicago, and a long-time computer jock: "It can't be used for touch typing, so it's useless."

We did find, however, that the keyboard is not as bad as all the adverse publicity would lead one to think. The reach between keys is natural. The keyboard itself is very lightweight and has two adjustable slope settings. The keyboard did, at first, feel "squishy," similar to typing on marshmallows, but we adapted quickly to the feel. The greater problem is that the keys are not labeled on the keys themselves, and we found ourselves leaning over the keyboard to read the labels. The shape and spacing of the keys allows templates, which identify special function keys in a program, to be placed over the keys. But

they're no easier to read than the original key designations. (*For an in-depth look, see The Keyboard, page 16.*)

Another much-questioned PC*jr* feature is the keyboard's infrared link to the system unit. This feature supposedly allows the user to sit farther from the screen, or even walk around the room. Frankly, we found this to be a gimmick for all but the hopelessly farsighted. Why would anyone want to sit ten feet away from the screen, which would certainly make it difficult to read? Interference from electric and electronic devices is possible in an office setting, but hooking up the optional direct connection cord will end all communication problems.

Speaking of Software

There is a serious cap on the PC*jr*'s abilities because it accommodates only one disk drive. This hampers usage of any program that requires multiple disk drives to allow for large amounts of data storage, i.e., database management programs, accounting packages, and so on.

Also, the Junior's 64K or even 128K memory limit will prevent it from taking advantage of integrated software such as *Lotus 1-2-3* and "professional power" packages like *MultiMate* (a word processor that mimics the Wang dedicated word processor) which require about 192K for effective utilization. Some of these high-powered packages are being configured for the Junior, but some functions such as mail merging and spelling checkers may be sacrificed due to Junior's small memory.

To properly evaluate the PC*jr*'s potential as a business tool, we ran some of the most popular business software on a 128K model, with an RGB color monitor, internal modem, and disk drive. All programs were unmodified versions that we have been using on our PC under DOS 2.0. Can Junior use its big brother's software? Our overall results were heartening, and suggest that many businesses will find the PC*jr* a low cost way of introducing or expanding microcomputer use.

Here's what we found:

Word Processing

EasyWriter 1.15. *EasyWriter* ran with no problem, but it performs a lot of disk access, meaning that the program disk must be left in the PC*jr*'s single drive. (The version of *EasyWriter I* released this year also runs on the Junior, and includes a spelling checker and a mailing list feature.)

MultiMate 3.2. We didn't think that *MultiMate* would work on the PC*jr*, given that it requires at least 256K to run. As expected, the program took one look at the PC*jr*'s limited memory and promptly died. (*MultiMate Jr.*, designed specifically for the PC*jr* with over 50 functions, will be out soon.)

PeachText 1.00. According to IBM, *PeachText* is not recommended for the PC*jr*, yet the program performed flawlessly during our evaluation. We're not sure why it's not recommended—maybe because the program occupied a large chunk of the PC*jr*'s memory.

WordPerfect. The program occupied about 70K of the PC*jr*'s memory. When we tried to move from *WordPerfect's* main menu, the program gagged, sputtered and froze up. (The manufacturer recommends *Personal WordPerfect* for business use of the PC*jr*, although a lower-cost *WordPerfect Jr.* has been released.)

WordStar 3.3. The program loaded with no problem, but displayed in a 40-column mode. This difficulty can be fixed, though, with a slight modification of the program. Another problem is that *WordStar* frequently accesses the program disk for more instructions, making it difficult to put data files on a separate disk. Also, *WordStar* needs to be installed on a two-disk system.

VisiWord 1.0. The program ran with no problems and displayed in 80 columns, but *VisiWord* suffers from the same disk access weakness as *WordStar*. In addition, although this program is easy to use, it's so slow that many people will find it frustrating to use for business correspondence.

Spreadsheets

Lotus 1-2-3. No chance here. *Lotus* requires too much memory for use on the PC*jr*.

Potential purchasers are considering the PC*jr* as an alternative or adjunct to the PC.

Multiplan. *Multiplan* worked fine, and displayed in 80 columns when we typed *mode 80* while still in DOS. *Multiplan 1.2*, scheduled for April release, will include the PC*jr* when asking the user to specify computer type. The new version includes color, too.

SuperCalc. *SuperCalc* worked perfectly on the PC*jr*. Easier to learn than *VisiCalc*, *SuperCalc* could become the most popular spreadsheet for the Junior. (*SuperCalc*^{3} designed specifically for the PC*jr* will be available in May.)

VisiCalc. This venerable old program executed flawlessly. *VisiCalc* is a natural for the PC*jr*, given its popularity on the PC and the familiarity many people have with it from having used it on many older microcomputers.

DATABASES

dBase II 2.4. *dBase II* worked with no problem, but the PC*jr*'s single disk drive severely limits its use. The program frequently accesses the disk during file creation and when seeking additional instructions. This means that all data will have to be stored on the program disk.

pfs:file 1.05. We had no problems operating *pfs:file*. This program, however, is inefficient in its creation of files and records, quickly chewing up a lot of disk space.

In the overall analysis, the PC*jr* will probably find its place most immediately in the small business and home business marketplace. The small business user is not likely to be disturbed by the keyboard limitations, and might even relish the fact that it's geared to non-touch-typists. The available word processing software suits a more limited correspondence. Memory limitations won't be a drawback for spreadsheet and file management use in smaller firms.

The PC*jr* may also enter the corporate world as a portable computer. Junior offers more memory than notebook computers, at a lower price and weight than the Compaq and other IBM-compatible portables.

Junior is becoming an efficient corporate networker, too. IBM's recently announced "cluster program" connects up to 64 IBM computers. Executives who may not be heavy computer users might prefer the smaller PC*jr* to the PC. However, as configured, the disk drive, modem and printer cannot be installed in the PC*jr* while the computer is connected to the network—or Junior could burn out. A possible solution might be to connect the PC*jr* with an outside power source.

WILL JUNIOR GROW UP?

Will the PC*jr* expand with the increased demands of business computing, or will its growth be stunted by IBM's attempt to limit capabilities?

IBM has one of the most sophisticated marketing strategies found in corporations today. It's no surprise, then, that the PC*jr* is designed to be as compatible with the PC as possible without allowing for the possibility of "super" PC*jr*'s competing directly with the PC.

The limits on the PC*jr* are physical barriers imposed by IBM: 128K RAM, and only three expansion slots. Yet according to a company spokesperson, "It's an open architecture system . . . the necessary information is available to third parties to encourage them to develop software and hardware peripheral equipment."

If the full potential of Junior's powerful microprocessor and operating system can be realized, the PC*jr* could become a powerful business tool in the foreseeable future.

As it stands today, we believe it can hold its own in the small and home business marketplace, and will fill a niche at the desktop level in many larger corporations.

Our advice to the potential business buyer: (1) Examine your needs to determine if limited memory and keyboard capacity will be a real detriment; and (2) be sure that the software you wish to use is compatible. If all systems are go, the PC*jr* may well be a smart business purchase, for now and for the future.

Sharon Efroymson and Raymond Hood are computer consultants with Microtrek, a New York City firm that advises and trains executives on the purchase and use of software and hardware systems.

The Junior promises to be a big help to small business.

Twenty-One Reasons to Process Your Words

A writer who kicked the typewriter habit confesses that even his love letters have never been better.

ILLUSTRATIONS BY JEFF FARIA

BY PETER MARTIN WORTMANN



To be fair, word processing isn't for everyone. On the other hand, breathing isn't for everyone either. It's been found, in fact, that those who don't breathe have a marked tendency to shy away from word processing.

If, however, you breathe on a regular basis, you should seriously consider making word processing a part of life. There are a thousand good reasons to do this. Here are the first 21 reasons—many of them practical and valid.

1. THE LETTER TO YOUR CONGRESSMAN

Along with the miracle of electronic editing, word processing offers what is generically known as "merge" capability.

You have a letter you want to send to 15 different companies. As you write the letter, you indicate places where entries specific to each company will later be inserted. You complete the text leaving these specially marked gaps and then open another file where you list the personalized material. In addition to the name, address and greeting, these entries might include a product name, the date of your last correspondence, or your favorite dental procedure (root canal?).

When printing the letter, you "merge" the information in the second file to fill gaps left in the first. Each letter is then identical except for these specially-tailored entries that personalize each letter.

What has long been known as the "form letter" is the archetype of merging. How heart-warming it is to receive

such personalized correspondence as "Dear **Mr. Limple:** You may have already won a Dynomatic Trash Smasher! And just think of how much it will improve the now tacky look of your kitchen over there at **27 Daffodil Lane!**"

Believe it or not, this particular example does not illustrate the merge capability at its humanitarian best. Letters to one's representatives in government, however, would be a fine and upstanding use of this electronic technology. Here's how to let the Capitol know what's on your mind.

A stock letter, perfect in form and content, sits in a file. Another file is brimming with the names and addresses of anyone in government with whom you might ever want to register a complaint or opinion.



Even if you have no intention of writing Washington, they'll know that you have the capability.

The big day comes: it's time to let those guys in Washington have it! Instead of lapsing into the old this-can't-possibly-be-worth-my-time stance, you bravely make your way to your word processor. You fill in the paragraph left open for the content of your message, choose your addresses, and with a few keystrokes, your printer is humming away, producing perfect letters and envelopes to match.

And even if you have no intention of writing anyone in Washington or City Hall, they'll all know that you have that capability. A postal deterrent! Interstate mail ready to speed its way through that window envelope of vulnerability!

2. The Resume

It is a little-known fact that the resume was invented in 1868 by one Simon Busby. Working in a primitive laboratory in the basement of his home outside Canton, Ohio, little Simon (voted by his high-school classmates as most likely to drown in a mud puddle) discovered one day that he could write down everything of interest he had ever done in his entire life on a very small scrap of paper. "Gee," said Simon, "This is really great. Now I can go get me a job."

How Simon made that leap of the imagination from his little scrap of paper to the world of employment has long puzzled historians, but what is clearly chronicled is that Simon made one calamitously influential error: he listed all of his life achievements in reverse chronological order. And ever since, the rest of mankind has suffered under the tyranny of having to list their most recent jobs at the beginning of their resumes and from there, work their way back.

So now, more than a century after Simon's breakthrough, you gather yourself together to embark on a serious job search. You pull out the old resume only to be reminded that no, you can't just tack a few tidbits about yourself on at the end. You realize, in fact, that updating your resume entails more work than you intended to put into your job-to-be.

Following the standard procedure in such matters, you "postpone" your foray into the job market, preferably for a decade or two.



IBM PCjr is a registered trademark of the IBM corporation.



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Circle No. 118 on Reader Service Card

But in the world of resumes, word processing has rewritten the standard procedures, finally rendering insignificant Simon's cruel curse.

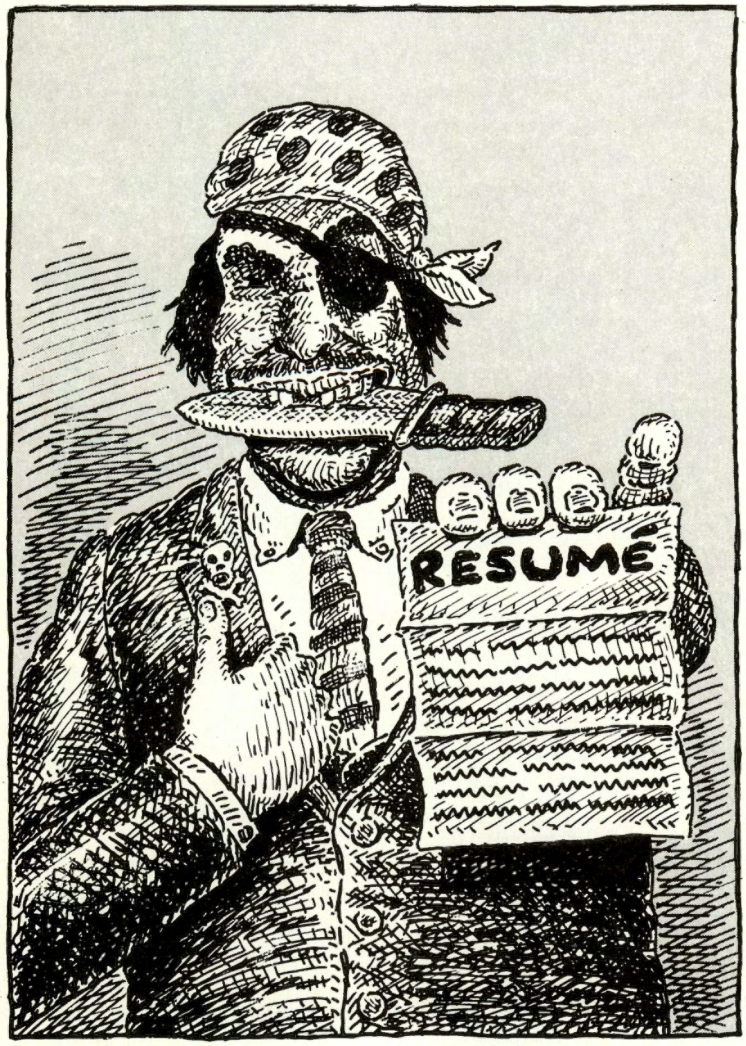
Sitting in front of your trusty screen, you just call up the file that contains your old resume and add your latest achievements right up top. Not only do you insert whatever you want wherever you want it, but you alter the margins to make it all fit better, check your spelling electronically, justify each line on the left and right columns, and then print up ten flawless copies of your resume on high-quality bond—each one an original.

To quote little Simon: "Voila! Employment City!"

3. The Cover Letter

The key to a successful mass mailing is making each recipient of your letter feel good. If he feels good about himself, he'll feel good about you. And once he feels good about you, you can put one over on him so fast it'll make his head spin.

Sit in front of your trusty screen, call up your old resume and add your latest achievements right on top.



Receiving the original letter rather than a xerox copy tells your recipient he's special. He's unique, just like the 684 other people from whom you'd be equally happy to hear.

Using the merge capability of your word processor, you produce nothing but originals for every potential customer. It's marketing's best-of-all-possible worlds! Everyone feels important. They feel loved. They feel happy and at peace with themselves.

And you feel great too, because you're at the heart of all this good will. You're the one pulling the wool over their eyes.

4. Letter to the Editor

Another threatening possibility. (See Letters to Congressmen.)

5. The Little Letter Explaining Once Again Why Johnny Wasn't at School Yesterday

6. The Thank-you Note

Dear Aunt Doris,
Thank you so much for the lovely Electric Toothpaste Key. I don't know how my life could have gone on without one. Our marriage is stronger for it . . .

7. The Ever-popular Love Letter

Some may scoff, but amorous pursuits are well within the word processor's realm. Love, they say, is eternal—so why not the love letter?

Does each new infatuation really deserve an equally new letter?

Is it really worth delving into the depths of your soul for yet another passionate appeal when all she ever said to you was, "Hey Buddy, pass me the ketchup"?

Absolutely not. With word processing, you can just whip out an old letter, spruce it up by merging in a couple of key words, and make someone feel special.

My Dearest Dorelia,
How sweet the memory of your golden

hair cascading through my fingers . . .

becomes

My Dearest Ethyl,

How sweet the memory of your hot-fudge sundae cascading into my lap last night. . .

8. Fan Mail

9. Hate Mail

10. Chain Letters

These deserve special attention. After all, could anything possibly be better suited to word processing than the chain letter?

"Send a copy of this letter along with a five dollar bill to the person at the top of the list. Put your name at the bottom of the list and in no time at all, you will receive five dollars from every living soul on the planet."

All fine and dandy, but haven't you always wondered why it is that, as the letter says, "Becky Farnsworth of Buckshot, Iowa, has already received more than $38,000" when you got zilch the last time you tried one of these things?

It's because Becky Farnsworth has a word processor. She put her little name directly on top (no dummy, that Becky) and then merged her letter with a mailing list she bought from Neiman-Marcus.

11. Newsletters

Decide what's fit to print and then just imagine—you don't have to send out another bulletin riddled with the ear marks of a message from "The Hunt & Peck Society of Pitiful Typists." You can word process a newsletter that actually *looks* like it's fit to print.

12. Term Papers and Other Collegiate-type Assignments

13. Reports of All Sorts

When a huge corporation's about to pull off something sneaky and millions of dollars are at stake, not to mention the fate of innumerable third-world countries, one question is consistently posed. An executive turns to a lawyer and says, "Well Langley, how does it look?"

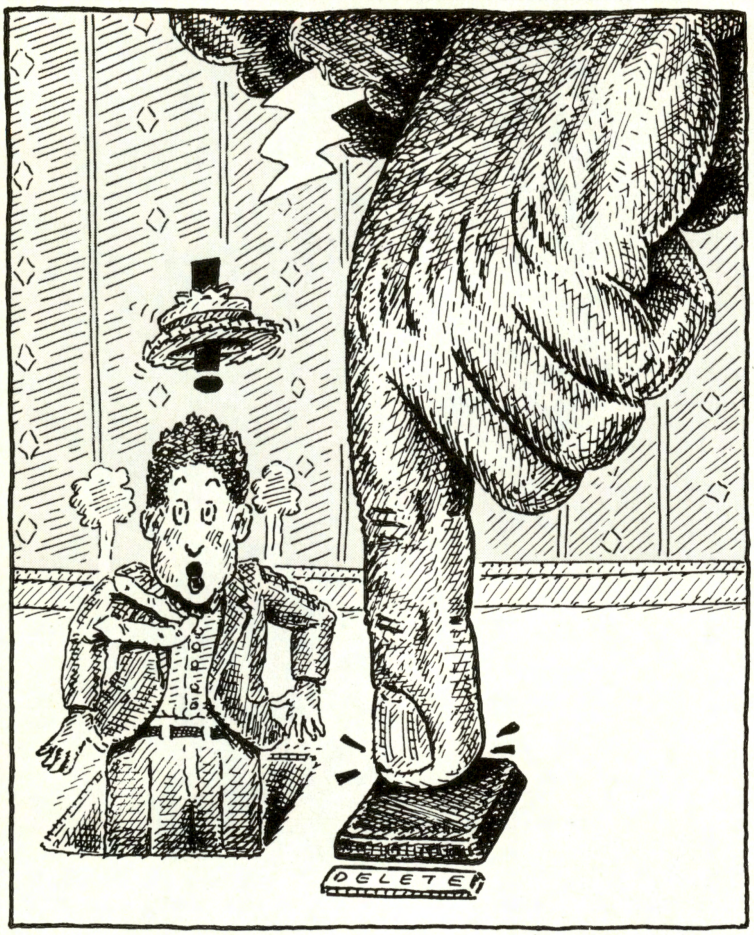


Could anything possibly be better suited to word processing than the chain letter?

It's not a question of how it's *going* or how it's *doing*, only how it *looks*. And this is because appearance, not content, is so often what moves the world.

The business report is the steadfast champion of this looks-over-content tradition. Reports are official. They tell the corporate truth and the message is always the same: "Things are looking up!" Things may actually be heading down like a lead olive in your third martini, but looks can be deceiving. In fact, looks are meant to be deceiving.

Now as the owner of a word processor, you can produce reports with great speed and alacrity—letter-perfect documents to support your every contention. You can report on club activities, on parent-teacher relations, on local politics, on business ventures. And



you will tell nothing but the truth because you would never think of taking advantage of the professional look and authoritative tone word processing bestows upon your every word.

14. Word Games

Particularly the anagram variety where they say, All right, Smarty-pants. Rearrange these letters to form a word:

STANINOUREV

Having long ago memorized every word in the English language that contains all five vowels, it is immediately apparent that this one unscrambles into INTRAVENOUS. But for those less burdened by such knowledge, spelling checkers with anagram programs can be purchased to supplement your word processing software. You type in something like:

ANAGRAM TAANSRIP

and faster than you can say, "I've always hated word games," it will not only offer the word ASPIRANT, but a second or two later it will slap you in the face with PARTISAN.

There are some people who would classify the use of such a program as, well, cheating. I try not to associate with those people and therefore have not the slightest twinge of guilt in presenting this reason.

With the delete command, you can banish an ex-friend to electronic, as well as social, purgatory.

15. Crossword Puzzles

One example should suffice. Let's see. How about a seven-letter word for "Metagenetic stage in every plant's development."

A toughie, no doubt, but you've already got some of the letters:

O—P—Y—E

Still nothing flashing across the old noggin? No need to fret. Just load your spelling checker program and punch up

ANAGRAM O?P?Y?E

A whir or two of a disk drive and you're on your way with—are you ready?—OOPHYTE. Not only have you solved 68 down, you've also added a useful new word to your working vocabulary.

16. Invitations

A natural for merging. Just keep a file with the names and addresses of all the people you like. Whenever you want to throw a little bash, merge them into the party invitation.

The real pleasure here is, of course, choosing who *does* and who *does not* deserve to grace your name and address file. You say that for your birthday the Hillingtons tried to get away with giving you back the canned ham you so thoughtfully presented to them last Christmas? A little work with the delete command and you've banished them to electronic, as well as social, purgatory.

17. Invoices

For those who work freelance and bill for services rendered, you can set up a template-like file designed for printing on your letterhead. By merging this outline of your bill with the specifics of a particular job, you eliminate all but a modicum of typing.

18. CHANGE OF ADDRESS NOTICES

Why not let everyone in on it this time? Feed in your by now well-stocked name and address file, switch on that printer and let 'er rip. You'll be getting your junk mail again before you can say, "Oh boy! Another opportunity to buy the Original Miniature Trusses of the World Collection!"

19. YOUR DIARY

Keeping a diary on disk may at first glance seem a bit coldhearted. But there is one advantage that far outweighs any possible regret over the loss of a hand-written diary's natural romance: you can go back and change things if they don't work out as you had hoped.

No unsightly crossouts, no pages crudely torn from your treasured opus. Just get in there and delete the undesirable passage.

My original entry for December 3rd was truly a poetic gem: "Henrietta's one woman who does make me yearn, with desire to have her. Oh how I burn!"

But on January 18th the young lady in question fled to Canada after having backed a moving van into my driveway and emptied my house of everything worth more than its weight in lint.

Was I embarrassed? Chagrined? Maybe, but in my electronic diary, I have set the record straight. And just imagine how self-assured I now feel when glancing back to find that even in early December, I saw the writing on the wall: "Henrietta's one woman who does make me yearn, to beat her about the face with a fern."

20. YOUR AUTOBIOGRAPHY

Now that you've learned the "nothing in life is so sacred that it can't be altered at a later date" lesson, you're ready to take the leap into the world of publishing. And don't be afraid. Just think of your autobiography as a chronicling of the events in your life as they might have happened had you been someone worth writing a book about.

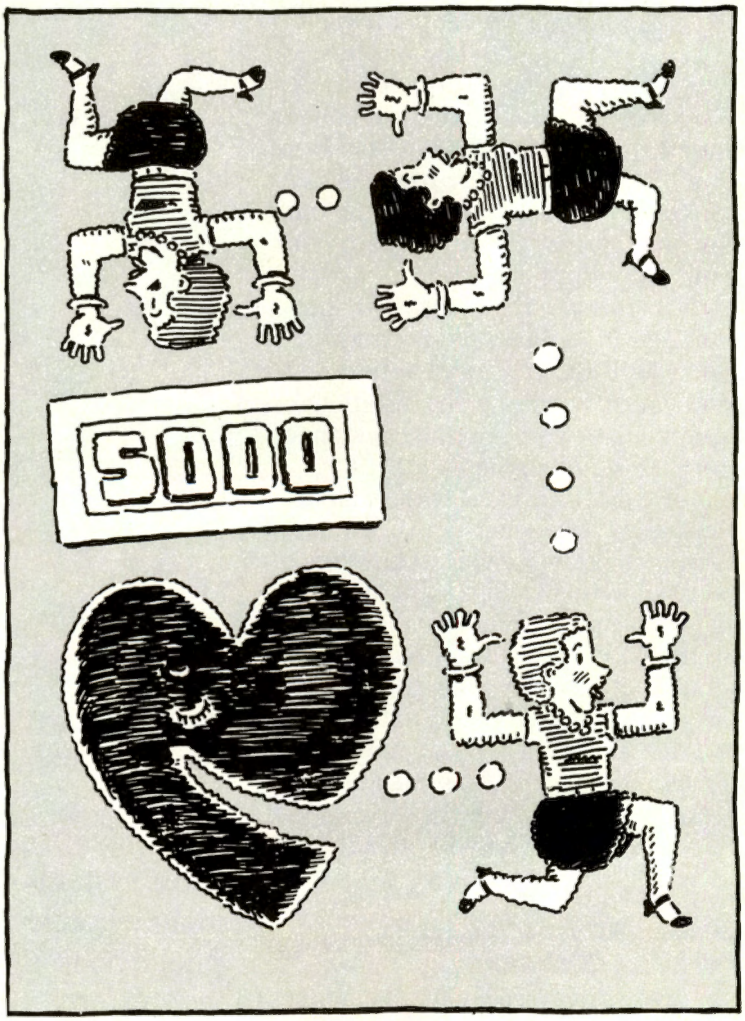
Keeping a diary on disk may seem a bit coldhearted.

21. YOUR NOVEL

Now I hear you saying, "I'm never gonna write a novel. I mean it would be nice and all, but I've never even written a sentence."

Take heart. At the age of 30, Joseph Conrad was a merchant seaman who didn't even know how to speak English. He didn't publish his first novel until he was 38. Now there's always the possibility that you don't have the kind of literary genius that produced *Lord Jim* and *Heart of Darkness*, but look at it this way: Conrad didn't have a word processor.

Peter Martin Wortmann is a freelance writer who lives in New York City. His work includes screenplays, fiction, and children's stories. As a writer who has seen the word processing light, Wortmann is now convinced that he could never live without one.



PC*jr*: Can You Bank on It?

Yes, if you deal with one of the 25 institutions now offering a home banking service.

By Bob Woods

The PC*jr* is designed to make your life at home easier and more efficient, right? The machine is supposed to fit into your life, not the other way around. So it stands to reason that an everyday function like banking would be a natural for the Junior, since most everyone has money in a bank and pays bills.

But what's the reality of home banking? Is it available today from your bank? Will the PC*jr* be able to do it? Will you have to buy any additional equipment or learn anything new about computers or banking?

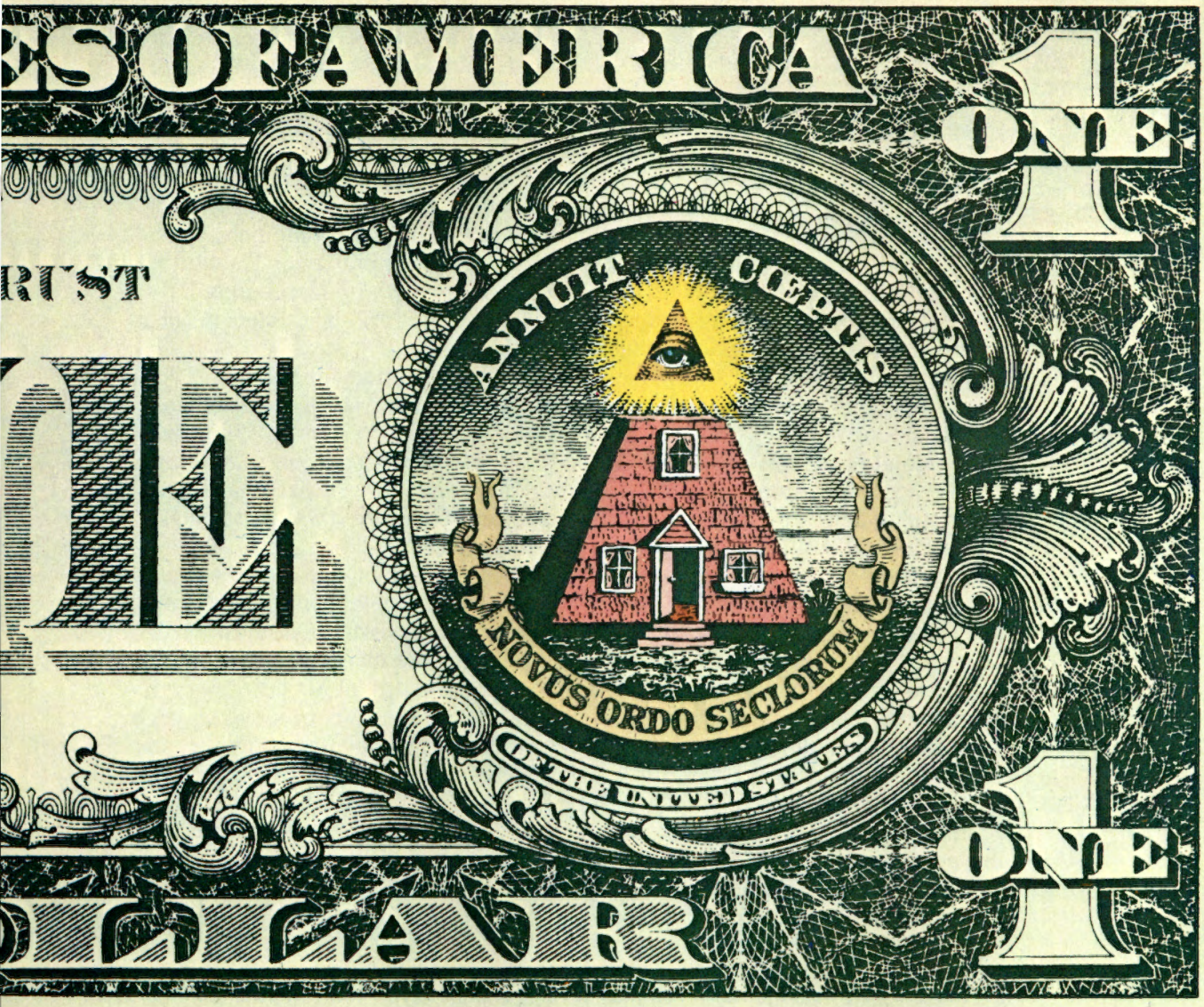
PEANUT checked with banks, consumers, computer networks, and computer experts to see just how practical a service home banking is at present and what the prospects are for banking on the PC*jr* in the future. Basically, we found that there are a handful of home banking systems available to the public and they appear to be easy to use and reliable. But there remain some questions concerning what range of services will be offered, and who will offer them.

Banking with the Magic of Modems

Precisely what "home banking" implies may differ from one system to another, but most include a telephone hook-up via modem (the device that allows a computer to send and receive messages over phone lines) between you and your bank's central computer. By calling up the computer, you have instant access to your account(s) and can make certain transactions. You can check your balances, transfer funds, direct the bank to pay your bills (some on a regular basis), and ask questions or leave messages for the bank. Obviously, you cannot make cash deposits or withdrawals; for that you still have to visit the teller or an automatic teller machine (ATM). Some systems provide other financial services, such as posting interest rates, money market information, or loan application information. Monthly fees range from $8-$12.

Most systems include a telephone hook-up via modem.

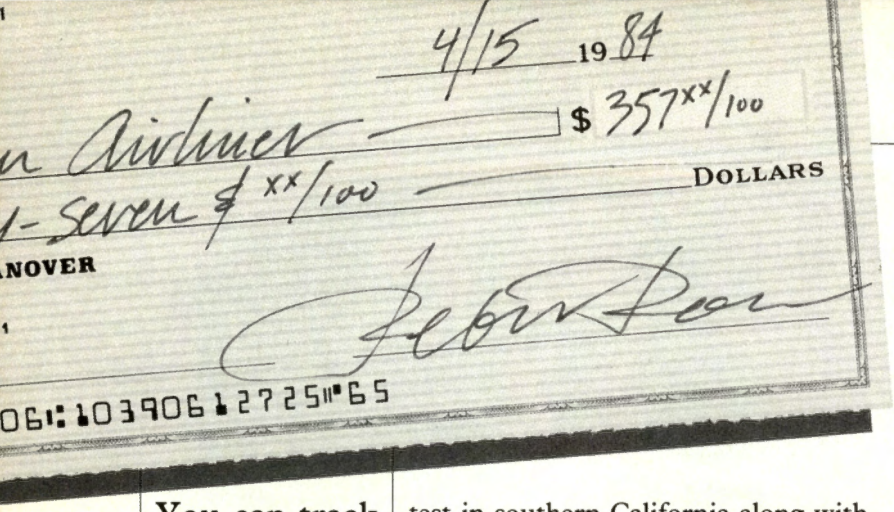
All of the systems PEANUT investigated are accessible with a PC*jr* equipped with a modem. You can buy the $200 internal modem IBM offers for the Junior or you can use any other brand of modem that connects to the Junior through the RS232 serial port in the back of the PC*jr*. Every modem that connects through the serial communications port requires a modem cable, which is available from most dealers. One of the banks we spoke with will sell customers a modem, but no matter where you get the modem, you will be able to easily install it yourself. Then,



the only other thing you'll need is the home banking software, which the bank will provide, along with simple operating instructions.

Since the birth of the personal or home computer in the mid-1970s, any number of banks, computer networks, major publishers, and cable-TV companies have launched home banking tests. Some are still being conducted and will be for several years to come; others are now in the evaluation stage. Most are small, limited-time tests, with a few hundred households participating. But with the growing number of home computers being bought, some experts feel the time has come to stop testing and start offering viable home banking systems to the public. This is exactly what is happening, but on a limited basis.

A good example is HomeBanking, a service offered since last November by Bank of America (B of A) through its 540 branches in northern California. B of A, headquartered in San Francisco, participated in a 1982 home banking



You can track a check almost immediately after it is written until it clears.

test in southern California along with Times Mirror Company, a newspaper publisher. B of A since decided to build its own system in-house and spent more than a year and $4 million designing HomeBanking.

"HomeBanking is available to any of our checking customers who have any brand of home computer equipped with a modem and a screen," says Maury Healy, a vice president at B of A. For $8 per month, HomeBanking users obtain a software package that allows them to pay their bills, check balances, transfer funds between accounts, and send electronic mail messages to the bank and other HomeBanking customers.

Emil Brioski, a member of a local computer club in San Francisco, was intrigued by B of A's ads for HomeBanking, so he asked the bank to give the club a demonstration. Brioski signed up immediately. "My only objection after the demonstration," he says, "is that it was too easy. HomeBanking is essential to me. I can make payments, which for me is more comfortable than writing checks." Although Brioski receives a regular bank statement of all his transactions at the end of each month, with HomeBanking he can see at any time where his accounts stand. For instance, he can track a check almost immediately after it is written until it clears.

In its first couple of months of operation, during which B of A offered a three-month free trial, HomeBanking attracted more than 8,000 customers, including Vice President Healy ("I hate licking envelopes and stamps," he admits); the system will be offered statewide this spring. "We want to enhance HomeBanking with a home-budgeting service in the future," says Healy. B of A eventually plans to offer investment services through its Schwab & Company discount brokerage subsidiary.

Pronto is a similar home banking service offered for $12 per month by Chemical Bank in New York City. Chemical began testing the system two years ago, then offering compatibility only with Atari 400 computers. Since the system went public last September, it is compatible with IBM computers—including the PC*jr*—and other major brands.

"Pronto offers home banking and electronic mail," says Sergio Sedita, a Chemical vice president. "With it you can access all your accounts, including savings, Visa, MasterCharge, and money market accounts, transfer balances between accounts, pay bills to 400 approved merchants, and record checks. You receive an electronic statement of every transaction." (Conventional statements are mailed monthly.)

Pronto also allows customers to add other merchants or services, such as mortgage payments, insurance, and utilities, to be paid via computer, without having to visit the bank and fill out forms. For example, you can direct the bank to electronically pay your mortgage on the first of every month and your gas and light bill on the 15th.

"The strategy behind Pronto has many sides," Sedita explains. "For the consumer it adds convenience and control over his banking. For the bank, it offers new marketing advantages and will reduce paper flow and manpower."

"My checkbook and I were never good friends," confesses Kathryn Brown, a Pronto user since the test stage. "Now I don't bounce checks anymore because I know my balance all the time. I was never a very good bill payer, but I don't even worry about it anymore. Actually, my creditors love Pronto more than I do."

Brown, a data processor, obviously enjoys the bill-paying features of Pronto, but has also used its electronic mail function. "I wrote a note to the bank asking a question about my account, and it answered me right away. I didn't have to deal with any red tape—

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105	128	151	174	197	220	243	266	289	312	335	358
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117	140	163	186	209	232	255	278	301	324	347	370
118	141	164	187	210	233	256	279	302	325	348	371
119	142	165	188	211	234	257	280	303	326	349	372
120	143	166	189	212	235	258	281	304	327	350	373
121	144	167	190	213	236	259	282	305	328	351	374
122	145	168	191	214	237	260	283	306	329	352	375
123	146	169	192	215	238	261	284	307	330	353	376

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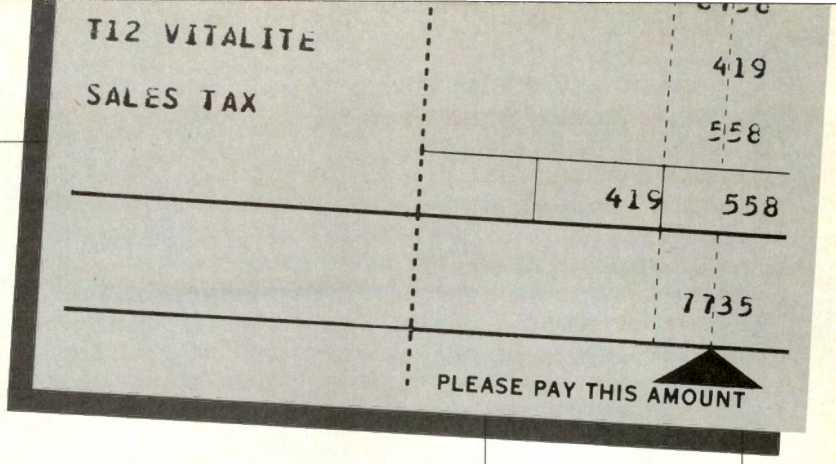
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and I didn't have to stand in line. I've also sent messages to other Pronto users, just for the fun of it."

Only about 25 of the nation's 21,500 banking institutions are testing or have introduced home banking, according to the American Bankers Association in Washington, D.C. Some are identical to Pronto—although the names are different—since Chemical is licensing the system to other banks. The eight banks that have signed up thus far include: Crocker National Bank in San Francisco; Florida National Bank in Jacksonville; Union Trust in Stamford, Connecticut; Manufacturer's National Bank in Detroit; Banker's Trust in Columbia, South Carolina; Worthen Bank in Little Rock, Arkansas; American Security Bank in Washington, D.C.; and First Bank of Pennsylvania in Erie. Chase Manhattan and Citibank, both in New York City, each have on-going pilot programs and are likely to offer home banking systems to the public sometime soon.

A unique feature of Pronto is that Chemical will sell users modems, but only for Atari home computers (for about $75), although it may one day sell modems for other machines, including IBM's. But for the most part, banks do not want to get involved with either selling any equipment or even recommending brand names. One exception is Huntington National Bank in Columbus, Ohio, which buys Radio Shack's TRS-80 computers and leases them to its Bancshare home banking customers.

Banking on a Nationwide Network

Huntington's Bancshare also represents another type of delivery system for home banking that is being explored. It is actually offered through CompuServe Information Services, Columbus, Ohio, (a subsidiary of H&R Block), a nationwide computer network that provides a host of services, including news, shopping, and games.

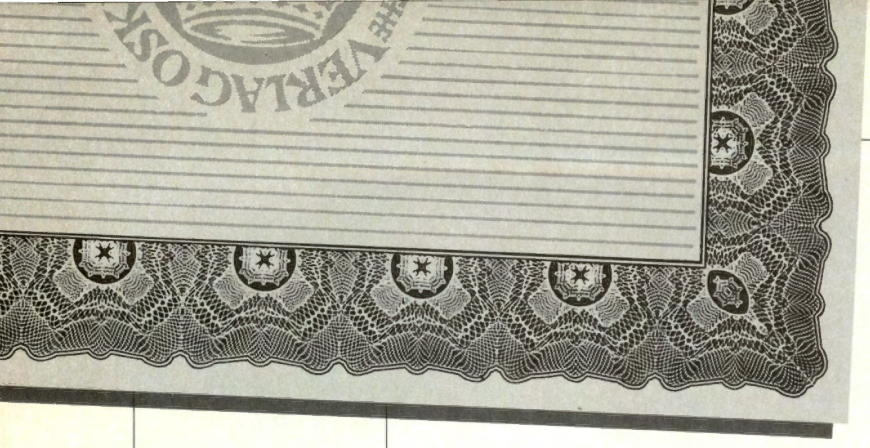
Bancshare customers pay Huntington $4 per month; they also pay for time on CompuServe, which costs $12.50 per hour during prime time and $6 per hour other times. Other banks tied into the CompuServe network include the Shawmut Bank of Boston (although it is currently not accepting any new customers), United American Bank of Knoxville, and Horizon Bancorp, a bank holding company in New Jersey. The Source, a similar computer network owned by The Reader's Digest Company, tested home banking in California but has discontinued the service until it can set up a network of home banking systems with local banks nationwide.

The CompuServe concept—offering banking along with other informational services via home computer—is seen by some as the wave of the future, but the argument remains that banking alone may not be enough to justify the costs. Frost & Sullivan, Inc., a New York City research firm, recently completed a study of how businesses offering information and financial services should approach the home market. The report states: "Normally home banking services must be coupled at the customer level with a whole range of related and unrelated other services in order to present a package to the customer that is attractive enough to warrant the costs involved."

There is a feeling that banks are not really positioned in the public's mind to offer services beyond the financial nature. They may expand into areas such as loan applications or stock transactions, but banks are not likely to offer electronic shopping or news and weather information. Rather, banks are now using tests and commercial systems more as marketing tools and as a way of acquainting themselves and their customers with the concept of such home services.

That partly explains why electron-

My creditors like my home banking system as much as I do.



Banks may offer electronic loan applications and stock transactions.

ic services including home banking are being explored by publishers such as Knight-Ridder Newspapers and Times Mirror, retailers such as J.C. Penney, and the newly deregulated AT&T. And not all these tests are conducted with home computers; some services, referred to as videotex, enter the home via cable-TV lines or a dedicated two-way terminal that's completely separate from a computer. Indeed, Chase Manhattan and Cox Cable Communications have announced a joint venture to develop home banking over cable-TV.

J.C. Penney recently bought a home banking system tested in Fargo, North Dakota, by First Bank System in Minneapolis, but has yet to offer a service of its own. Explains Penney's Stewart MacIntyre: "All we're saying is that we will continue to study and analyze videotex (including home banking) as a business Penney should expand into." And if so, he adds, "we see supporting both personal computers and dedicated videotex terminals." Anne Lovett, a senior analyst for the Yankee Group, a Boston research firm, says her company's studies concur that home banking will have to be "part of a larger informational system offered by banks or as a joint venture" with other types of businesses.

Electronic Security—Is It Possible?

With all this information going in and out of millions of homes, the question of security inevitably arises. Will Big Brother be able to monitor how much money you make or what kinds of goods you order electronically? Banks are among those working to ensure that neither Big Brother nor the local computer hacker is able to gain access to unauthorized information. For one thing, the banks have already gained some applicable experience working with automatic teller machines, and federal regulations will also help deter such high-tech criminals. The Electronic Funds Transfer Act regulates banks' operation of ATMs and consumers' liabilities when their accounts are tampered with through an ATM. But these regulations do not yet extend to home banking.

"Security is uppermost in our minds," says B of A's Healy. HomeBanking users must enter a two-step identification code in order to tie into the bank's computers. Furthermore, all bill-paying arrangements must initially be requested by the customer and approved by the merchant involved. "So even if someone could get into my account," says Healy, "he could only pay my bills or transfer funds between my accounts."

Pronto customers are assigned a household code by Chemical Bank and also select a personal code that even the bank is not privy to, says Chemical's Sedita. "We also have some other in-bank security measures. We have not had any problems with security and no further measures are being sought," he adds.

Security and privacy may become debatable issues as the number of home-computer households grows beyond its current level of less than ten percent. But for now, the more pressing issue for PC*jr* users of computer services like home banking is when and from whom they will be available. Most industry analysts agree that a wide range of financial services, coupled with additional information services, will be on the market within three to four years. Especially if everyone feels about HomeBanking as does user Brioski: "It's a service you have to have."

Bob Woods is a freelance writer who covers financial topics regularly. An avid user of ATMs (he doesn't remember what a human bank teller looks like), he is considering giving home banking a whirl. In an upcoming issue, Woods will discuss selecting the proper home banking system to fit your needs.

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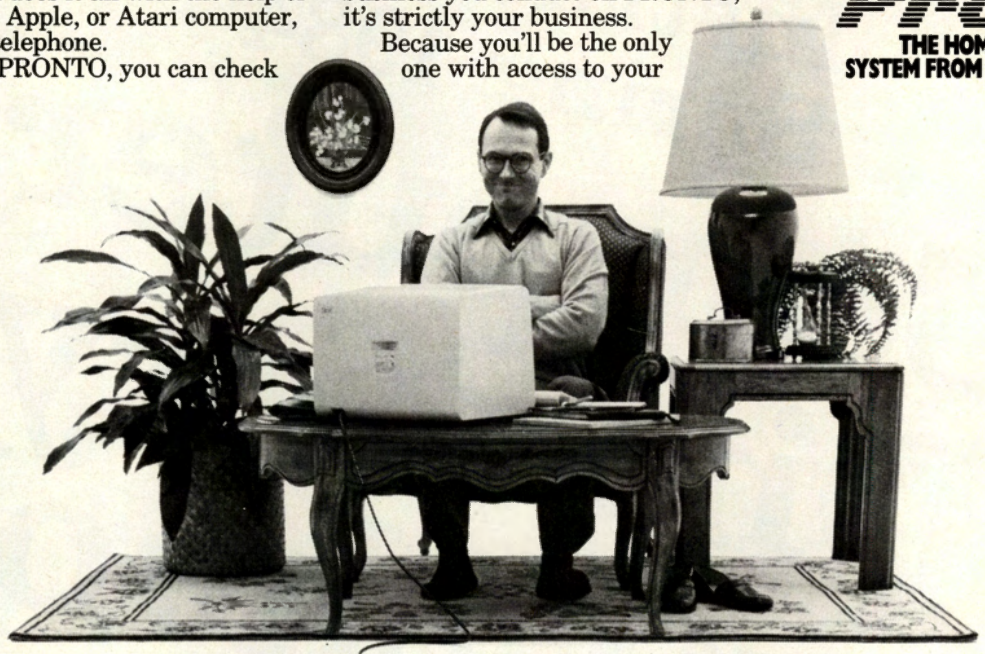
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PC

SOFTSELECT

A GUIDE TO PROGRAMS FOR THE PCjr

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EDUCATION 110

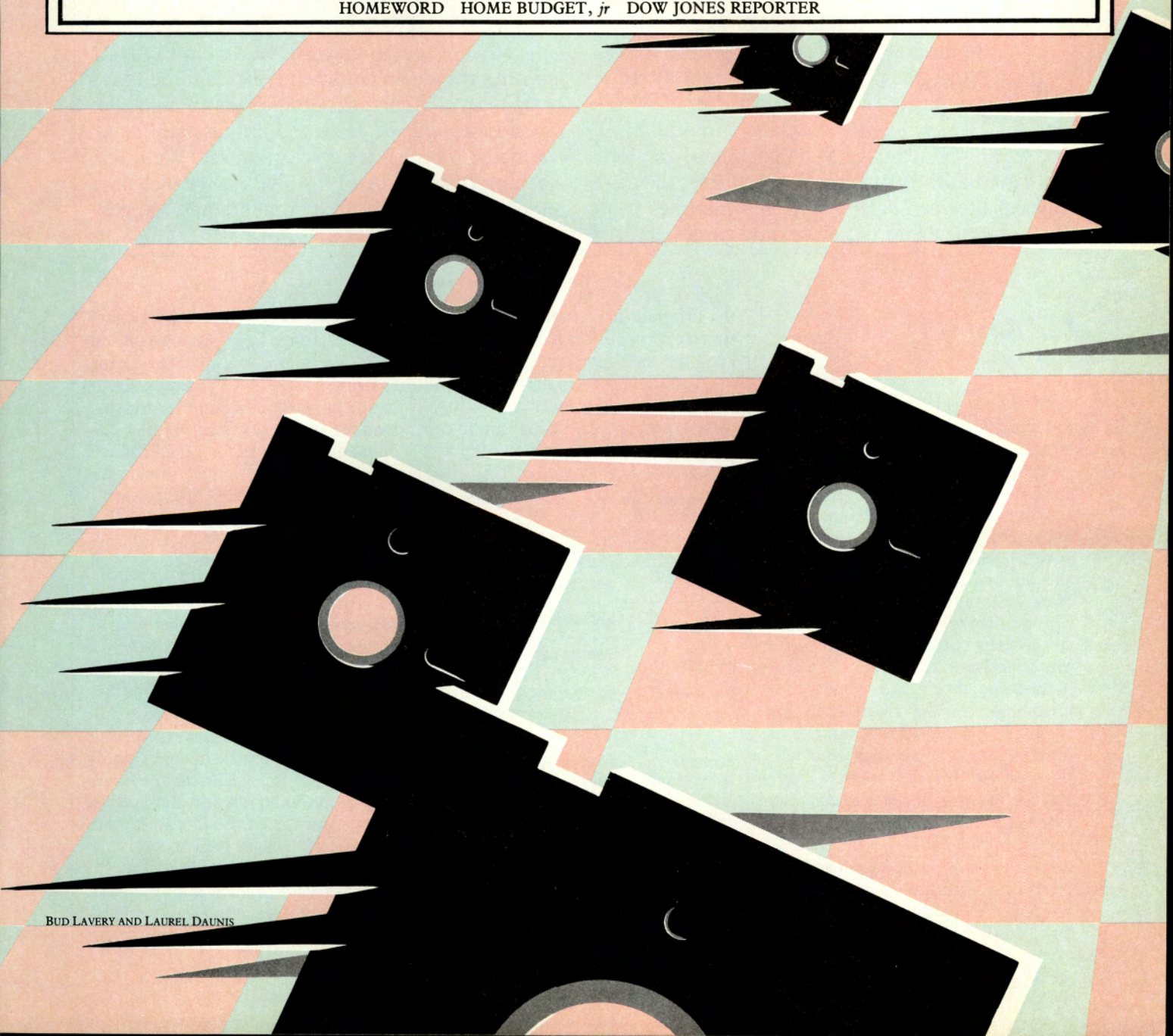
IBM LOGO DELTA DRAWING HOT DOG STAND

GAMES 115

CROSSFIRE MINE SHAFT SCUBA VENTURE MOUSER

PRODUCTIVITY 118

HOMEWORD HOME BUDGET, *jr* DOW JONES REPORTER



BUD LAVERY AND LAUREL DAUNIS

Software is the communication bridge between computer and computer user. The right software helps you apply the PC*jr*'s power to a wide range of tasks—writing, organizing and analyzing information, drawing, communicating, programming, and playing. The wrong software might bring you to banish your computer to a closet.

The personal computer industry has not yet established an effective system for consumers to evaluate software before they buy. And at $39 and up for a program, software is too dear to buy blindly. PEANUT's SoftSelect does the previewing for you and provides an authoritative guide to the best PC*jr* software.

We've designed our reviews to make it easy to quickly find the programs that might interest you. Programs are organized in three sections—*education* (for children and adults), *productivity* (software that helps you do any job more efficiently), and *games*. Of course, the distinction between each group is sometimes blurred—for example, electronic games can be educational, and education programs can improve your productivity. These general categories are only the first step in finding the software that's right for you.

After the title of each program is a short description of its purpose, followed by a chart in which our reviewers give a grade to important elements of each program. (The categories we rate vary for education, productivity, and game programs, and are explained at the beginning of each general section.)

Next is important information on buying and running the program; then comes the review itself. SoftSelect reviews explain how to use a program and suggest which PC*jr* users will find it useful for which tasks. The emphasis is on how to put a program to work, not on all its special features.

Most of the programs reviewed in PEANUT are ones that we recommend, albeit some more heartily than others. Programs that we consider second-rate will be reviewed only if they have somehow received a lot of attention. We'll let sleeping dogs lie. And, as always, we welcome and will respond to all comments and suggestions from our readers.

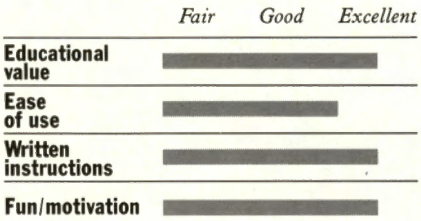
EDUCATION

More people buy a home computer for education than for any other stated reason. And there are thousands of programs that bill themselves as educational. In order to distinguish good educational programs from mediocre ones, we rate the program's *educational value; ease of use; written materials;* and *fun and motivation* for the user. Here are some questions we ask about a program to arrive at these ratings: Is the content correct and appropriate for the abilities and interests of the intended audience? Does it have defined objectives that are made clear to the user? Does it take advantage of the computer's power to interact with the user? Can it accept answers in several forms? Are "help screens" provided throughout the program? Are examples provided? Do the instructions avoid computer jargon and take a beginner through every step of starting the computer, loading the disk, and using the program? Does the program use graphics, color, sound, competition, or humor to keep the user interested?

Programs for which the answer to all these questions is "yes" get high marks, and are worth looking into.

LOGO

A computer language with a graphics mode kids love to learn with.



Price	*$175*
Hardware	*Disk drive; 128K*
Terms of sale	*Limited warranty covers defective disks for 90 days.*
Publisher	*IBM, P.O. Box 1328, Boca Raton, FL 33432; (800) 447-4700*

Logo Fever Sweeps the Country!
Logo Takes Schools by Storm!

These are headlines about a computer language named Logo. Three years ago Logo was available on only one microcomputer, the Texas Instruments 99/4A. Today, every major home microcomputer manufacturer advertises Logo's availability on its machines. In fact, the Peanut's older brother, PC senior, already has four different versions of Logo available. But the PC*jr* qualifies as the first microcomputer for which Logo has been available at the outset. So what is this thing called Logo?

Although Logo is often perceived as a newcomer in the alphabet soup of computer languages, it was developed more than 15 years ago through the work of Seymour Papert and his colleagues at MIT. The early history of Logo is important because the people who developed it were not only highly skilled computer scientists, they were also deeply interested in how people learn. And this is the key to Logo. Those early researchers at MIT wanted to create a language that would be easy to learn and use, even for young children, and would still be a powerful computing language with

sophisticated features. They believed that an appropriately designed programming language could be a tool for helping students of all ages learn not only particular subject matter, but, more importantly, about their own thinking and learning. Seymour Papert's book, *Mindstorms*, outlines his vision of the potential that computers and languages like Logo might have for revolutionizing what we learn and the way we learn it. But this is getting a bit ahead of the story because the first thing to know about Logo is how easy it is to get started and how much fun it is to use.

Although Logo can be used to do many things, from generating computer poetry to simulating a lunar lander, it is best known for its graphics mode, known as turtle graphics. To draw with the turtle, a small white triangle at the center of your screen, you simply load Logo into your computer and type the command: SHOWTURTLE. And there it is, ready to go to work.

Two commands are all you need to begin; the first is FORWARD, which makes the turtle move forward and draw a line, and the second is RIGHT, which makes the turtle rotate and head in a new direction. Each of these commands must be followed by a number that will tell the turtle how far to go in a particular direction (FORWARD 50) or how many degrees to turn (RIGHT 90). Often beginners are simply taught these two commands and then are given the chance to see what they can do.

Here is where the whole spirit of Logo differs from most other educational programs and languages. The idea is to give you a few simple tools and then to turn you loose. Unlike many activities in which you have to go through a set of lessons or exercises, in Logo your own imagination and creativity become the focus. The manual for *IBM Logo* is written in this style, encouraging you to try out your own ideas.

Although there is a lot of talk about Logo being designed for students, adults get just as excited and engaged with it as do children. It doesn't take very long before users, adults or children, want to know such things as how to get the turtle to lift its drawing pen so they can separate the letters when drawing their initials (PENUP raises the turtle's pen and PENDOWN reactivates it); or how they can add color to their creations (SETPC for Set Pen Color allows you to change the color of the turtle's lines).

One of the educational advantages of using Logo in this way is that while exploring and creating shapes and designs, you are also working in a world of geometry, but a world quite different from the one of theorems and formulae we experienced at school. It is a geometry of action and experimentation. If you decide to make a house with a triangular roof, for example, you will have to figure out how much to turn the turtle to create the corners of a triangular shape. You can try to apply any knowledge of geometry you already have or you can discover the answer by a "trial and revision" approach to learning. This approach makes the ideas of an abstract topic such as geometry accessible to even young children. As a simple example, let's take Sandy, a young child who has not had any formal geometry, and observe her dialog with the turtle as she tries to make it draw a square.

With the turtle sitting in the middle of the screen pointing up, Sandy's first step is: FORWARD 10.

"No, I want it bigger. Let's add some more": FORWARD 40.

"Good, that's better. Now a turn. I'll try": RIGHT 50.

"Hmmm! The turtle hasn't turned far enough to make my square corner; turn it some more": RIGHT 30.

"That's closer, but not quite enough": RIGHT 10.

"That's it! Now forward again. Let's see. I did 10 and then 40 so now": FORWARD 50.

"Now another turn. What was that? 50 and 30 and 10, that's 90 all together": RIGHT 90.

FORWARD 50, and so on until she finishes the square.

Logo provides immediate feedback (through the turtle's movements) that allows a user to evaluate his or her ideas and then revise them. It is this quality that makes Logo's turtle graphics an especially powerful learning tool. In this case, it makes the ideas of geometry immediately accessible to the youngest users.

Logo's simple commands and immediate feedback are only the beginning. Once you've made a shape or design you like, you are ready to be introduced to the real power of Logo—the ability to create your own new commands. Most computer languages have a predetermined set of commands with a standard vocabulary. But if you want to create a new command in Logo, say to tell the computer to draw a square, you can use those instructions to create a new command that you can name whatever you like: SQUARE or BOX or just SQ if you want to avoid typing. The process works as follows: First experiment until you have a sequence of commands to draw your shape. Then type the command TO and the name you want to give to your shape or design. Sandy might call her square a box so she would type: TO BOX.

Logo is not a program you'll outgrow. The possibilities are almost endless.

Once she types TO BOX, Logo goes into a learning mode and instead of carrying out her commands, it simply remembers them. Sandy now types in the commands she used to make her square shape (FORWARD 50, RIGHT 90, FORWARD 50, RIGHT 90, and so on) and then the command END to tell Logo it's the end of her definition. Logo responds that BOX is DEFINED and from then on every time Sandy types BOX, the turtle will draw her box just as she taught it to. Sandy has literally created a new word in Logo's working vocabulary.

New commands that you teach Logo are especially exciting because once you've created them, you can use them to create other more complex commands. Sandy can put several of her BOXes together to create a TOWER command:

```
TO TOWER
BOX
FORWARD 50
BOX
FORWARD 50
BOX
END
```

It might not be long before she teaches Logo how to make a CAS-

TLE. Another child might put four BOXes together to make a WINDOW or even create a series of nested different colored boxes to make a wonderful visual effect called TUNNEL.

After exploring the turtle's drawing power, many young programmers branch into designing interactive games using the turtle. There is something special about being able to create your own game, even if it is just trying to get the turtle to land on a space station target. One of the nice features of making your own games in Logo is that you can change your space station into a basketball hoop at any time, because you are the game's designer.

People have referred to Logo as a "toy" language; they seem to feel that it is a graphics toy for children. This is a popular misconception; its great flexibility simply makes it usable for everyone. A high-school teacher can use Logo to help students explore equations for drawing parabolas. A friend uses it to keep a complete index of a record collection. A colleague has developed a story-writing program to help his daughter with creative writing. A student has created a Logo program to help design sets for an amateur theater company. A program for young children allows them to control the turtle with single key presses (F for forward, R for right). This program is included in the IBM manual under the name DRAW and is only five lines long. On the other end, Logo has been used by graduate students to explore a variety of topics, from the physics of planetary motion to computer modelling of animal behavior. Logo is not a program you will outgrow. The possibilities are almost endless.

But what is IBM's version of Logo for the PCjr and how does it stack up against all the other versions? In terms of fundamentals, all Logos are pretty much the same. They all have turtle graphics and allow you to create your own new commands. In addition, they all include capabilities for manipulating language, doing mathematical calculations, and using advanced programming structures such as recursion. Where they differ is in special features. For users familiar with other Logos, this IBM version has some nice enhancements. *IBM Logo* allows you to change the turtle's shape and to fill a closed shape with color using the FILL command. You can also print text on the turtle's graphics screen. It includes a primitive music command, TONE, that allows you to generate sounds and notes. For advanced programming, it has a powerful system for saving and reading information directly to a disk. This includes the capacity to save and read pictures. This ability to easily use a disk for data storage and retrieval is a big improvement over earlier microcomputer Logos. One feature of other Logos that *IBM Logo* lacks is sprites, multiple turtles that can support animation.

IBM's Logo package comes with a Logo Language disk and two books. The disk allows you to load the Logo language into your PCjr and the books show you how to use it. The first book is a tutorial called *Logo Programming with Turtle Graphics*. It is made up of 17 short chapters, each of which introduces a Logo idea such as how to move the turtle, how to define your own procedures, using color, creating a simple game, and so on. It is an interactive text that you are expected to use at the computer, a "type this in and see what happens" kind of approach. The explanations are clear, and shaded "Bug Boxes" warn in a very helpful way about common problems (typos, forgetting punctuation, etc.). The text is richly illustrated. In general, its style is very supportive to new users, a trait too often lacking in computer manuals.

The second book is the reference manual. It includes an alphabetical listing of Logo's built-in commands with explanations, examples, and diagrams. This book also includes technical information on such things as file handling, Logo's use of memory, and how Logo handles numbers. There is a useful chapter on developing a Logo project that takes you step-by-step through a program for generating story problems, as well as a short chapter on useful commands, called "tools," that you can create yourself.

Although this reference manual is well done, there is a gap between what you learn in the tutorial guide and what is available in the reference guide. Powerful Logo features such as recursion, commands that output a value, and list processing are touched upon only superficially, if at all. The difficulty is that Logo is such a rich language with so many possibilities that it is hard to introduce it all in just one volume. Luckily, Logo fever has generated some excellent books that can take up where the IBM book leaves off. Three that you might try are:

Learning with Logo by Daniel Watt (New York: McGraw-Hill, 1983).

Logo for the Apple II by Harold Ableson (Peterborough, NH: BYTE/McGraw-Hill, 1982).

Mindstorms by Seymour Papert (New York: Basic Books, 1980).

Logo is difficult to sum up, but perhaps the words that come closest are those of a teacher whose first computer experience was with Logo: "Logo was developed to create an interactive environment, a mathland, in which students can set their own pace, problems, and goals. It is a comfortable way for me to enter the future. It is challenging, it is a way I can understand, and it lets me feel in control."

Richard Carter *is director of the Educational Computer Center at Lesley College, Cambridge, Massachusetts, and a contributing editor to* Hively's Choice, *a catalog of educational software.*

DELTA DRAWING

An easy introduction to computer graphics and programming.

	Fair	Good	Excellent
Educational value			
Ease of use			
Written instructions			
Fun/motivation			

Price	*$49.95*
Hardware	*Disk drive; 64K*
Terms of Sale	*Defective disks replaced free within 30 days of purchase; $5 charge after 30 days. $12 for back-up disk at any time.*
Publisher	*Spinnaker Software, 215 First Avenue, Cambridge, MA 02142, (617) 868-4700*

Delta Drawing is a program that invites you to use your own creativity as a way to explore the world of computers, computer graphics, and computer programming. It's what I call a "layered" program, that is a program with a top layer of commands that are

easy to use for getting started, but which also has several other layers of commands with increasing sophistication that you can use whenever you are ready.

When I try out a new piece of software one of the questions I always ask is: would this be appropriate for someone with little or no computer experience? All too often the answer is a resounding no! I have seen more people than I care to think of turned off to computers because their first experience with software was one of frustration, confusion, and defeat. *Delta Drawing* to the rescue! Here is a program that begins by literally putting the graphic power of the computer at your fingertips.

Delta Drawing starts by framing your screen in purple and placing a triangular shaped pointer, the Delta, in the center. The Delta is your drawing instrument and you control it by simply pressing single keys. Press D and the Delta moves forward and draws a line, press R and the Delta turns to the right, and, as you might guess, press L for a turn to the left. To move the Delta without drawing a line you use the M key. These four keys are all you need to begin exploring the graphics world of the computer. There's one other helpful key—if you draw a line further than you meant to, or turn too many times, just press E to erase your last command. Or if you want to simply start over, hold down the CTRL key while pressing E. The screen will be cleared, and the Delta will return to the center. On the other hand, if you like what you've drawn and would like to see it drawn again, just hold the shift key and press G (for graphics) and the Delta will dutifully redraw your design from scratch. Delta Drawing is full of little features like these that make it easy, forgiving, and fun.

Creating computer graphics wouldn't be complete without color and *Delta Drawing* allows you to add color with the strike of a key. The Delta itself starts out white and draws a white line. To change colors press C; the Delta changes to the color of the line it will draw (after pressing once the color is blue). Press C again and the Delta changes to a pinkish hue; its line will now be pink. These three colors are IBM's primary color set, you can add yellow to each of them by pressing Y (producing yellow, green, or red). These simple drawing and color commands create what I call the first layer of *Delta Drawing*—at this level learning five or six keys allows you to draw pictures and designs of all kinds.

Next is a layer that allows more precise control. For example, if a young user, after experimenting a bit, wants to draw shorter lines for a moustache on the face he or she is constructing, holding down the SHIFT key while pressing D moves the Delta half a Draw-line, and if that's not fine enough, the CTRL key used with D makes just a dot. Would he or she like to fill in the face with pink and make the eyes white? If the child has learned to draw colored lines, you can show him or her how CTRL F can be used to fill in enclosed areas with the color of choice.

Another layer involves the computer's capacity to remember. *Delta Drawing* remembers and stores every command you give it and it allows you to save any set of commands as a program for later use (and in true Delta style you press S to save a program and pressing T lets you see the text list of your commands). For example, if you've made a flower and decide you'd like to fill the screen with flowers, you can save your first flower (using the S key), then move the Delta around pressing the FN key (this stands for function), and 1 key (for program 1) each time you want a flower. If you want a colorful garden you could use CTRL F to fill them with different colors. Now if you want to add some birds, draw just one, save it with S and add it to your picture by positioning the Delta and pressing FN2 (for program 2) for each bird that you want. Suddenly you can not only produce computer graphics, but you have written a computer program as well! *Delta Drawing* puts you in control of the computer quickly and easily by letting you experience some fundamental aspects of computer programming.

From here there are many routes you can explore. You can experiment with intriguing geometric features like Mirror, which makes a mirror image of your drawing, or Kaleidoscope, which uses multiple Deltas to draw four simultaneous kaleidoscopic copies of your drawing. Or you can learn how to use the labelling features that allow you to print numbers and letters in various shapes, sizes, and orientations on the screen. Then try your hand at some advanced features to create simple, but pleasing animation.

And the layers continue. Once you've learned how to create a program and seen your moves recorded on the text screen, you can move deeper into programming and learn how to edit a program by changing the text record. For instance, if you've made a square, but now want it to be bigger, instead of redrawing the whole thing you can learn to simply change the text record of your program directly.

There is more: *Delta Drawing* gives you the ability to use random numbers and even a primitive kind of variable for making geometric constructions that change in size. Even in these more sophisticated features *Delta Drawing*'s programmers have paid careful attention to making things as simple as possible. Look, for example, at the process of accessing the storage disk—transferring information to and from your own blank floppy disk. The mumbo jumbo of computer jargon and error messages usually associated with these operations is a common cause of hand-wringing frustration in novice computer users. The designers of *Delta Drawing* have handled this aspect of their program with the same care and concern for the neophyte that they did with the first layer of drawing commands. To access the disk system press CTRL S. Then to save your programs, simply press S, type a name for your programs in the indicated box and that's it, you're done. To load programs that you've previously saved into *Delta Drawing*, press L (for list) from the disk system and simply use the arrow keys to move the highlighter to the name of your program file. Once you've used these commands you wonder why no one has made disk operations so easy before. *Delta Drawing* has been so carefully designed for errorless ease of use that I believe it sets a standard against which we can judge other software.

A second place where many programs drive users to distraction is the documentation or written instructions. Too often the manuals are unclear, poorly organized, full of jargon—just not helpful. *Delta Draw-*

ing's manual is a welcome relief, following the layered approach of the program. Delta's commands are introduced in two chapters. The first, titled Fundamentals, is itself divided into 11 two-page sections, each of which introduces two or three new commands or ideas. Each two-page spread has a diagram to show you what to expect on the screen and a shaded box that outlines the new commands. The second chapter, titled Advanced Techniques, goes on to show you how to use *Delta Drawing*'s advanced features such as changing the size of your drawing or using random numbers in your program. It uses the same two-page format, but includes more content under each new idea. The manual is rounded out by a chapter of sample *Delta Drawing* programs (from fireworks to a crossword game board); a chapter on using the disk filing system and a printer (*Delta Drawing* allows you to print out your programs and pictures if you have an appropriate graphics printer); and a categorized list of commands with an indexed glossary of terms.

Delta Drawing is advertised as a learning program for kids, but why should they have all the fun? One of the delights of this program is that you can make the graphics as easy or as sophisticated as you wish. It is an ideal program for introducing just about anyone to the world of computers. It also functions well as a graphics tool that is both powerful and easy to use. For those who are interested in using computer graphics in programs written in other languages, *Delta Drawing* gives you the option of saving pictures in a way that allows them to be accessed by other languages. I have had students create pictures in *Delta Drawing* and then use them in games they have written in BASIC or Logo.

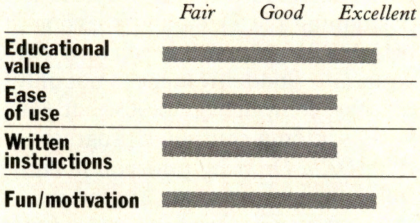
Delta Drawing's triangular delta seems to invite comparison with Logo's turtle *(see review of Logo on page 110)* and well it might, for as the *Delta Drawing* manual acknowledges, it was a Logo program named *Instant* that provided the original inspiration for the *Delta Drawing* program. In fact, the first versions of *Delta Drawings* were written in Logo. *Delta Drawing* is actually a small subset of Logo, customized and restricted for ease of use; *Delta Drawing* is *not* a programming language. It does not have IF-THEN conditionals, does not allow the creation and naming of variables, nor their use to store various kinds of information. It also does not have Logo's powerful arithmetic, text processing, or interactive functions.

Another interesting comparison between Logo and *Delta Drawing* concerns the role of mistakes. In Logo, "mistakes" are seen as a source of learning. Logo is designed so that when things do not turn out the way you expect, you have to take a look at them. There is no "erase" key, and a series of Logo error messages has been carefully designed to help you identify the source of difficulty. In *Delta Drawing*, eradicating an unwanted or unexpected result is only a keystroke away; press E and it's gone. These features make it easy and pleasing to use *Delta Drawing*, but create a different focus from Logo that pushes users to reflect on what they are doing. I really don't think comparisons between Logo and *Delta Drawing* are appropriate. *Delta Drawing* is a specialized tool that is limited to graphics, and at graphics it succeeds admirably, creating a friendly single-key controlled environment that "draws" you gently and intriguingly into the world of computers while setting new standards for clarity and ease of use.

—Richard Carter

HOT DOG STAND

This simulation program gives kids practice in running a business.



Price	*$49 (includes back-up disk)*
Age level	*7 to adult*
Hardware	*Disk drive; 64K*
Terms of sale	*Lifetime warranty – free replacement of damaged or defective disk*
Publisher	*Sunburst, 39 Washington Ave., Pleasantville, NY 10570, (800) 431-1934*

Money is what everyone likes to make, and *Hot Dog Stand* is great practice for the budding capitalist in your household. Players run a hot dog stand at a series of eight football games, and in the process attempt to multiply their initial $200 bank account into many times that much profit. My ten year old son and I (playing both separately and together) ended up with anywhere from $367 to $2,145!

Of course the hot dogs aren't real—they're simulated because *Hot Dog Stand* is known as a simulation game. Simulations let you find out "what would happen if . . ." They ask you to make many of the same sorts of decisions (based on many of the same sorts of facts) that you would in real life. In this make-believe hot dog business, the first thing you must decide is how many hot dogs and buns to buy. The manual tells you to base your decisions on the weather forecast (not always accurate); your own guesses about attendance for the particular day and hour of the game; and other special circumstances (such as Homecoming, when crowds are often much larger). You also must buy certain non-spoilable items such as soda, chips and courtesy kits to go with the hot dogs.

The buying is half the fun, because of the intriguing little trucks which roll across the screen carrying the goods. But don't get too enthralled by the nice graphics; it's easy to overspend your account and end up with no money to buy courtesy kits (napkins, mustard, relish, boxes) to go with your hot dogs.

Once the day of the game comes, you get an accurate weather report and can then set the prices to charge. The computer does the rest, using the formulas built in by the programmer to calculate the number of each item sold and your profit. A nice chart appears on the screen to tell you how you did. Leftover hot dogs and buns are a total loss, but the rest of the items may be stockpiled for sale the next week.

Playing *Hot Dog Stand* for a profit requires a good deal of mental figuring. For example, you buy hot dogs and buns by the dozen, but courtesy kits in lots of 25, 100 or 250. Buying larger quantities of the non-perishable items has the advantage of a lower unit cost. And unit costs must be on your mind if you expect to set prices to make money. Soda is sold to

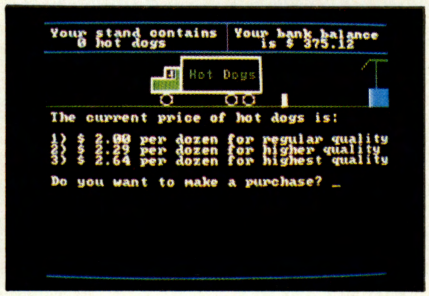
you by the case (24 cans), chips in lots of 10, 50 or 100. All of these different numbers mean you are constantly converting from one type of unit to another, to be sure you'll have enough chips and soda and kits to go with the hot dogs.

I found myself trying to construct a "system" to beat the computer. Figuring out the influence of weather, game time, and price on sales takes some time and record keeping. What was harder was figuring out how much money to spend on each type of item so that I'd have similar quantities of everything to sell. For that task, my calculator was invaluable.

Is *Hot Dog Stand* a good game to buy for your youngsters? Can it be played for fun, without looking too much like math practice? Having watched a ten-year-old happily play it for hours, my answer is yes. It's the sort of game that can be played by luck and instinct, so that you learn to beat the system by experience; the more mathematically minded can keep elaborate records and devise formulas and strategies in an effort to succeed more consistently. It also can be easily played by a group of two or three, as well as by just one player. Group play has the advantage of forcing players to verbalize their strategies in an effort to reach decisions.

The program itself is easy to use and provides a chance to re-enter information if you notice that you've keyed a number incorrectly. However, I did find it annoying that when I entered $45 instead of $.45 for the price of chips, the computer took me literally. Prices over a certain level ought to prompt a "Do you really mean that?" response, instead of spoiling the round. I also found somewhat frustrating the fact that I could not ask to see information from a former screen (such as the schedule of games or how many sodas I had left over); however, I soon learned to take more complete notes so I'd have that information in hand. Perhaps the programmer meant to prompt that response. One helpful feature is that the program calculates the unit cost for each item and displays it while you are setting prices.

At the moment, *Hot Dog Stand* is packaged and marketed as a program for use in schools. The package includes a manual that suggests strategies for using *Hot Dog Stand* effectively in classrooms and a back-up disk of the program. The school version also comes with a lifetime war-



ranty that guarantees free replacement of a damaged or defective disk.

The fact that only a school version of *Hot Dog Stand* is available shouldn't dissuade you from considering this program for home use. Other Sunburst educational programs that are currently marketed to both schools and homes are sold in two different packages. The home versions come in a smaller package with only basic operating instructions and no back-up disk. They also cost $10 less than the school versions. But the programs themselves are exactly the same.

I hope that Sunburst gets enough requests for *Hot Dog Stand* that it decides to offer a home version soon. The program combines a good deal of fun and challenge with valuable practice in estimating quantities and in making decisions based on several variables. In the process, it builds real-life business skills that children don't often have a chance to practice.

Beth Lowd *is a specialist on computers in instruction for Lexington Public Schools, Lexington, Massachusetts.*

GAMES

Some computer owners won't admit it, but the most popular use of home computers is game playing. The PC*jr* has excellent graphics and sound capabilities for a computer in its price range, which will make it a hit as a game machine.

When we rate the *playability* of a game, we rate different elements for different types of games. In an action, arcade-type game, playability includes the responsiveness of the program to joystick, paddle, or keyboard controls; the creativity of the game's concept and strategy; its ability to hold a player's interest; the "fairness factor"—the game's ability to make a player feel he was beaten "fair and square" and that he came close enough to try the game again; and the option of playing the game at several different skill levels. Clear high resolution color graphics are very important to arcade games.

Strategy and adventure or role-playing games hold a player's interest with text or a combination of text and graphics. The originality of the story line is crucial to these games' playability. We also consider adventure games' ability to hold a player's interest, the complexity of written answers it will accept, and the amount of disk access that the program must perform.

The games reviewed in this issue have been released by IBM specifically for the announcement of the PC*jr*.

CROSSFIRE

A classic action game that challenges the most skillful player.

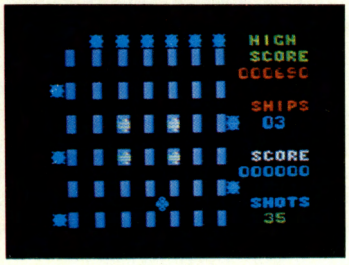
	Fair	*Good*	*Excellent*
Graphics		■■■■■	
Playability			■■■■■

Price	*$35*
Hardware	*64K; joystick (optional)*
Terms of Sale	*Limited warranty covers defective disks for 90 days*
Publisher	*IBM, P.O. Box 1328, Boca Raton, FL 33432, (800) 447-4700*

A plague of deadly insects has invaded your city. Your job is to eliminate them. You slide behind the controls of your pesticide-shooting attack ship and enter the gridlike downtown area that the insects are occupying. Suddenly, an insect appears in the row above you. You fire a missile upwards while sliding to the left to avoid his return fire. But when your missile strikes the insect, it doesn't die, but returns in a new, more vicious form. You begin to realize that this job is a tough one—but somebody's got to do it!

Crossfire, a fast-moving arcade game for the PC*jr*, calls for sharp eyes and quick reflexes. Listen carefully now. In *Crossfire* you

move freely within a grid of streets, but you may only stop in intersections where you are vulnerable to bullets fired by the insects from above, below, and to your left and right. You must shoot each of the four incarnations of an insect to destroy it. At times, jewels will ap-



pear in the streets and you may accumulate bonus points by running over them. If you manage to clear the entire screen of insects, you will be taken to a new, faster level.

You may use the keyboard or joystick to control your vehicle. While the joystick is easier to use at first, the keyboard makes it easier to move in one direction while shooting in another—and at the higher levels, that's an important necessity.

The graphics are sharp and detailed and the animation is very smooth (objects don't flicker as they move around). While the creatures are drawn in only a few colors, they change each time you complete a level of difficulty. The sound effects, although simple, are effective and appropriate.

Crossfire has a fine history; the first version was written for the Apple II and two years of good sales in the computer game field make it a respected veteran. The early computer games were copies of arcade games—Space Invaders, Pac Man, and so on—and because computers had less than perfect color and sound, they suffered by comparison with their arcade parents. But *Crossfire* has been successful because it is a high-quality game and one of the first that wasn't a copy of an arcade game. It also introduced a feature no arcade game had: an enemy that comes back to life. Since *Crossfire*'s first release, it has been translated for many other home computers and its popularity has helped it become one of the classic games for home computers. The PC*jr* version captures the spirit of the original game very well.

One warning: This is definitely not a game for arcade novices; it requires you to look in three or four directions simultaneously, and you must move in one direction while shooting in another. But if you are a skillful arcade game player, this game will provide all the challenge you can ask for. *Crossfire* is definitely the star among the initial PC*jr* games.

Mark A. Gollin *is a contributing editor to* PEANUT.

MINE SHAFT

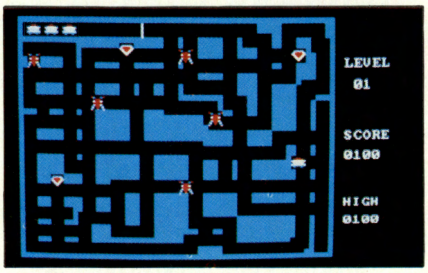
An action game for the novice game player.

	Fair	*Good*	*Excellent*
Graphics		■	
Playability			■

Price	*$35*
Hardware	*64K; joystick (optional)*
Terms of sale	*Limited warranty covers defective disks for 90 days*
Publisher	*IBM, P.O. Box 1328, Boca Raton, FL 33432 (800) 447-4700*

You are deep in a mine. You must guide your mine car through a maze to pick up four jewels and shoot berserk robots with your laser gun. There are three types of robots. Two of them can be destroyed with your laser gun, but the remaining type can only be avoided, not destroyed.

Mine Shaft is a good, though easy, arcade game. The graphics are exceedingly simple: straight black tunnels against a colored background. The characters (a mine car representing you, and the three types of robots) are rendered fairly well,



with good attention to detail. The animation is smooth, even at the higher levels where objects move quite quickly.

The game is fun to play, especially if you're not an arcade game wizard with hand-eye coordination that defies belief. Whether you use the keyboard or joystick, the car is easy to control (although it takes practice to maneuver quickly around corners). I recommend this game highly for anyone who finds most arcade games a bit too difficult to enjoy. Those who thrive on difficulty will have to look somewhere else.

One last note: *Mine Shaft* isn't new. It was originally written for the Apple and released on a disk containing three other games more than a year ago.

—Mark A. Gollin

SCUBA VENTURE

Dive for buried treasure in this arcade-style game.

	Fair	*Good*	*Excellent*
Graphics		■	
Playability		■	

Price	*$35*
Hardware	*64K; joystick (optional)*
Terms of sale	*Limited warranty covers defective disks for 90 days*
Publisher	*IBM, P.O. Box 1328, Boca Raton, FL 33432 (800) 447-4700*

This game purports to have you "explore treacherous underwater caverns and avoid perilous sea creature while you search for buried treasure." The reality of *Scuba Venture* is a boring game with little action and even less challenge.

The graphics are blocky, few colors are used, there is almost no animation, but worst of all, there is no strategy. The main threat to the diver is a large, unaggressive fish that stays at the bottom of the screen throughout the game. A phantom diver appears from time to time, to impede progress, but his actions are totally random so it is just a matter of luck to avoid him.

For a game to be fun, it must make you feel that you can do better the next time you play; it must inspire you to continue. The enemy in *Scuba Venture* is not anyone or anything you can get involved in trying to do away with.

Arcade games live and die with play action or the lack of it, and *Scuba Venture* provides very little action.

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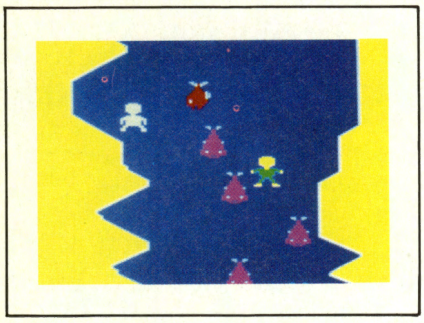
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To gain points your diver must touch certain fish on the screen or pick up keys that open treasure chests. But the screens don't change often



enough, so it is easy to anticipate just about every obstacle or reward. After five minutes of playing *Scuba Venture* (without losing one diver to the lazy fish at the bottom of the screen) I grew tired of it. This is certainly the weakest link in the new chain of IBM PC*jr* games.

—Mark A. Gollin

MOUSER

A complex strategy game.

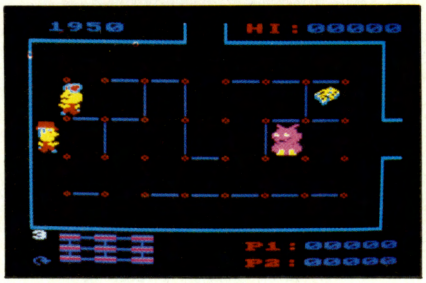
	Fair	Good	Excellent
Graphics			
Playability			

Price	*$35*
Hardware	*64K; joystick (optional)*
Terms of Sale	*Limited warranty covers defective disks for 90 days*
Publisher	*IBM, P.O. Box 1328, Boca Raton, FL 33432, (800) 447-4700*

Mice are on the loose in Farmer Wheatbread's farmhouse. You must trap them by surrounding them with the movable walls that are in each room. Some rooms are dark (it seems the farmer forgot to pay his electric bill), and if you haven't picked up a flashlight earlier in the game, you will be unable to navigate these rooms. You may pivot the walls clockwise or counterclockwise; if two walls end up on top of one another, a push from the farmer will cause them to separate.

I found *Mouser* to be strangely unappealing. The graphics are sharp, detailed, colorful, and attractive—as good as those found on many coin-operated games—and the play concept is original and interesting. But why isn't this game much fun? Part of my problem lies in expecting *Mouser* to be an arcade game and discovering that it isn't.

An arcade game relies more on reflexes than on strategic thinking. There are hybrids, of course, which require some strategy, but the basic requirement still is to move fast. While *Mouser* is billed as a reflex-arcade game, it really is a strategy game. Quick action is not necessary for success. Since the walls only rotate, it is a complex problem figuring out how to get them across the room to where the mouse is. Although contact with a mouse is fatal, the mice don't seek you out. Rather, they run randomly around the room which makes it pathetically easy to avoid them.



This game is notable in that it is nonviolent—you try to cage the mice, not blow them to bits. So, if you want a nonviolent game that challenges your cleverness more than your reflexes, *Mouser* may be the game for you.

—Mark A. Gollin

PRODUCTIVITY

Productivity is a catch-all category that includes word processing, database management, accounting, telecommunications, spreadsheets, financial planning, utility programs, and so on. The rating categories for these programs are *ease of use; written instructions; performance;* and *error handling.*

Ease of use is the most important aspect with these productivity tools. Any program that promises to make you more efficient should have well-designed, easy-to-read screen designs, plenty of help screens, and prompts that can be understood by a computer novice. Keep in mind, though, that a program with a high ease-of-use rating may still require you to put in many hours of practice before you learn to use the program efficiently.

Written instructions for software are notoriously dismal and dense. Good documentation should anticipate and answer questions that may arise with users of all levels. It should use an attractive layout, and include a tutorial, illustrations, and an index.

Overall performance rates a program's reliability, speed of operation, usefulness, and value for the price. (A $50 word processor is judged by different standards than a package that costs $500.)

The rating for *error handling* looks at how a program reacts to an incorrect input. Some programs "die" when you make a simple entry error. Others politely ask you if you're certain that's what you really want to enter before they accept a mistake.

HOMEWORD

A general-purpose word processor easy enough for beginners.

	Fair	Good	Excellent
Ease of use			
Written instructions			
Performance			
Error handling			

Price	*$75*
Hardware	*Disk drive; 128K*
Terms of sale	*Limited warranty covers defective disks for 90 days*
Publisher	*IBM, P.O. Box 1328, Boca Raton, FL 33432, (800) 447-4700*

HomeWord is an ideal general-purpose word processing program that will satisfy all the writers in most families. It's one of a new generation of word processors that puts ease of use ahead of powerful but often unused functions.

After the initial loading and entering of date and time, the screen breaks up into three areas: the typing area on top; the *icons* or picture prompts; and the document outline in the lower right. Directions for the next step always appear on the screen, which is a help to every user. In this case, the screen says to "Press ESC to go to menu," which I did. Immediately six pictures appear and the document outline disappears from

view. Each of these six images represents a different task in preparing a finished document: PRINT; EDIT; FILE; LAYOUT; PRESET VALUES; EXIT TO DOS.

Selecting any one of these icons or modes will immediately lead to another set of icons. The PRINT mode, represented on the screen by the outline of a printer with a sheet of paper rolling out of it, leads to three choices: PRINT DOCUMENT starts the printer (assuming you have one attached to your Junior) printing out a copy of the words you have typed on the screen; STARTING PAGE NUMBER permits you to select what page of the document you want to print or see; and SEE FINAL DOCUMENT lets you see what your document will look like printed out in 80 columns. This last command is a very helpful tool if you are working on a 40 column screen. One of the first things I had to learn when I started writing letters using a word processor was where to put the date on a 40 column screen. It cannot be placed on the right side of the screen, since this would be at about column 30 on a 66 column letter and would appear in the middle of a letter when printed. With *HomeWord*'s FINAL DOCUMENT command you're able to see what you will get on the printer beforehand, which saves lots of time and paper.

Move the cursor to the EDIT icon—a sheet of paper with cross-outs—press ENTER, and you're presented with 5 commands: COPY TEXT; ERASE TEXT; MOVE TEXT; FIND; and FIND AND REPLACE. These commands hold the real power of any word processor. They allow you to move whole sections of text around in your document, and add or erase text. And, with the press of a few keys, the computer will search out any word or phrase and replace it with new words.

I confess I used this editing power when I had three daughters attending college at the same time. I would write one letter using the word processor, then edit it by deleting the beginning and the ending and adding a personal greeting and sign-off for each daughter. My daughters eventually compared notes and caught on to me, but it saved me a lot of time while it lasted. All of these commands are easy to use in *HomeWord*, thanks to the program's many icon screens.

The specific commands in the FILE mode are: GET DOCUMENT; SAVE DOCUMENT; ERASE DOCUMENT; and INSERT DOCUMENT. These let you save what you're writing on a separate disk and combine parts of different documents. This combining two or more pieces of writing from different files is often called *file merging*.

The LAYOUT icon leads you to five commands that help you plan the appearance of your final draft before it's printed. ALIGNMENT permits you to align the right or left sides of your document; justify the text (make each line exactly the same length); or center a line. NEW PAGE indicates where you want to start a new page when your document is printed. SET SPACING sets margin sizes, line spacing (single, double, or triple space) and tab stops. PRINT STYLE gives you the choice of boldface, normal or underlined text; and HEADINGS/FOOTINGS permits you to add a heading or a footnote to the document being printed.

The PRESET VALUES icon leads you to: MAKE BACKUP DOCUMENTS; CHANGE PRESET MARGINS; SAVE PRESET VALUES; 40/80 COLUMN SCREEN; TYPE OF PRINTER. This is the "utility" part of the program that lets you modify many of the printing instructions that *HomeWord* automatically carries out.

The EXIT TO DOS command stops *HomeWord* and puts the computer back into DOS (the Disk Operating System).

Whenever you first move to the icon menu, a box is around the third icon (file). Move the box to another icon with the cursor-left and cursor-right keys. As you move the cursor, the name of each icon appears below the box. To select any option move the box to the correct icon and press ENTER.

Now let's go through the process of typing in a simple letter and saving it on a disk. To do this, you must first prepare a document disk that you'll use to store your letter on. It is always advisable to have a separate document disk with all word processing packages to protect your program disk from accidentally being erased or ruined. First load *HomeWord* and get to the menu screen. Move the box to

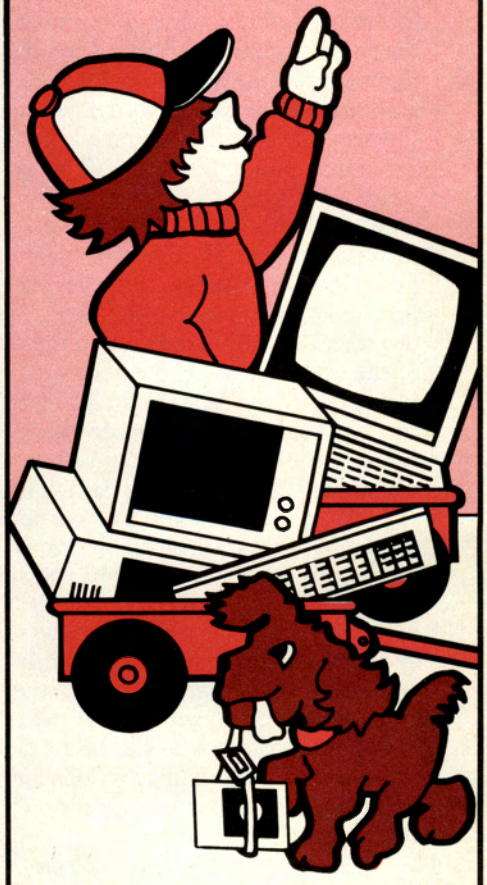
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the EXIT icon and press the ENTER key. Soon an A appears on your screen. You now type *format*, press ENTER and follow the instructions, which will ask you to put a new disk in the drive and press any key. Formatting prepares a disk so your Junior can send information to it.

Now that you've formatted a disk, again load *HomeWord* and follow the directions on the screen to insert the document disk. The cursor is now blinking in the typing area. Two types of cursors appear on the screen in *HomeWord*, a short line or a small box. The box cursor you see at the upper right of the screen means you are in the INSERT mode. Anything you type will be inserted. If you want to use the whole screen to enter text, you can remove the icons and the document outline by pressing the function (FN) key and then the F1 key. These same two keys bring back the icons and document outline. Start typing the letter and only press the ENTER key at the end of a paragraph, not at the end of each line. When you reach the end of a line the computer will automatically move the word down to the next line on the screen if all of it will not fit on the line above. This is called *word-wrap* and it does away with having to hit the "carriage return" at the end of each line. Now press the FN and F1 keys to display the icons and document outline. This document outline at the bottom right of the screen shows the letter as it would be laid out on an 8½ by 11-inch sheet of paper. A blinking dot appears in the outline to show you where your cursor is on the page. To save the letter, press the ESC key to get the cursor to the icon menu. Move the box to the FILE icon and press ENTER. The computer asks you to name the document. Press ENTER again and the computer goes to work and saves the document. To print the letter, press ESC to get back to the icons. Move the box to the PRINT icon, press ENTER, and directions for making the printer work appear on the screen.

It sounds easy and it is. *HomeWord* never leaves you with a blank screen or just a blinking cursor without directions on how to proceed. And remember that the ESC key is your "panic button." Press it and you'll always get help. The only drawback of this easy-to-learn icon system is that once you know the program well, working through the series of icons to change tasks seems slow and unnecessary. The program anticipates this and gives you a faster way to move from function to function. You simply press the CTRL (control) key or the ALT (alternate) key together with a letter and you bypass the icon screens. For example, to get a document you can simply press the CTRL and G key together, instead of going through the selection of different icons. (The cursor must always be in the typing area to use these shortcuts.)

The *HomeWord* manual is well written and easy to follow. It is rare that a computer hardware or software manual is written for the true beginner—most become clear only after hours of use. *HomeWord*'s manual is a welcome exception.

HomeWord is a perfect word processing program for beginners, but also one that seasoned writers familiar with other word processors will want to try.

Chuck Kirst *is chairman of the math and computer department at Cold Spring Harbor High School (New York) and owner of Harbor Software.*

HOME BUDGET, *jr*

An easy-to-use record-keeping program that helps organize a budget.

	Fair	Good	Excellent
Ease of use		■	
Written instructions			■
Performance		■	
Error handling			■

Price	*$45*
Hardware	*Disk drive; 128K; Cartridge BASIC*
Terms of sale	*Limited warranty covers defective disks for 90 days*
Publisher	*IBM, P.O. Box 1328, Boca Raton, FL 33432, (800) 447-4700*

Now that the tax season is behind us, the cry from households around the country is, "where has all the money gone?" Each year we "develop" a new scheme to attempt to tame the beast of disorder. The electronic age, and the guys in the white shirts and ties, have allowed us to reach out to a new sexy ally, the IBM PC*jr*.

Armed with my Junior and the *Home Budget, jr* program, I approached my desk, careful not to topple the piles of paper that are arranged in an order that would make the gods of entropy happy. My filing system is simple— somewhere on the desk is everything I need—I think.

After the appropriate disks are initialized (a process that requires the merging of the DOS with the program and the formatting of data disks), the *Home Budget, jr* program is loaded and you are on to the world of organized finance. The first step is to create the accounts; these are the general areas in which you may spend money during a typical month. *Home Budget, jr* limits the names of the accounts to eight letters, but provides space for 48 different categories that may be added or changed at any time.

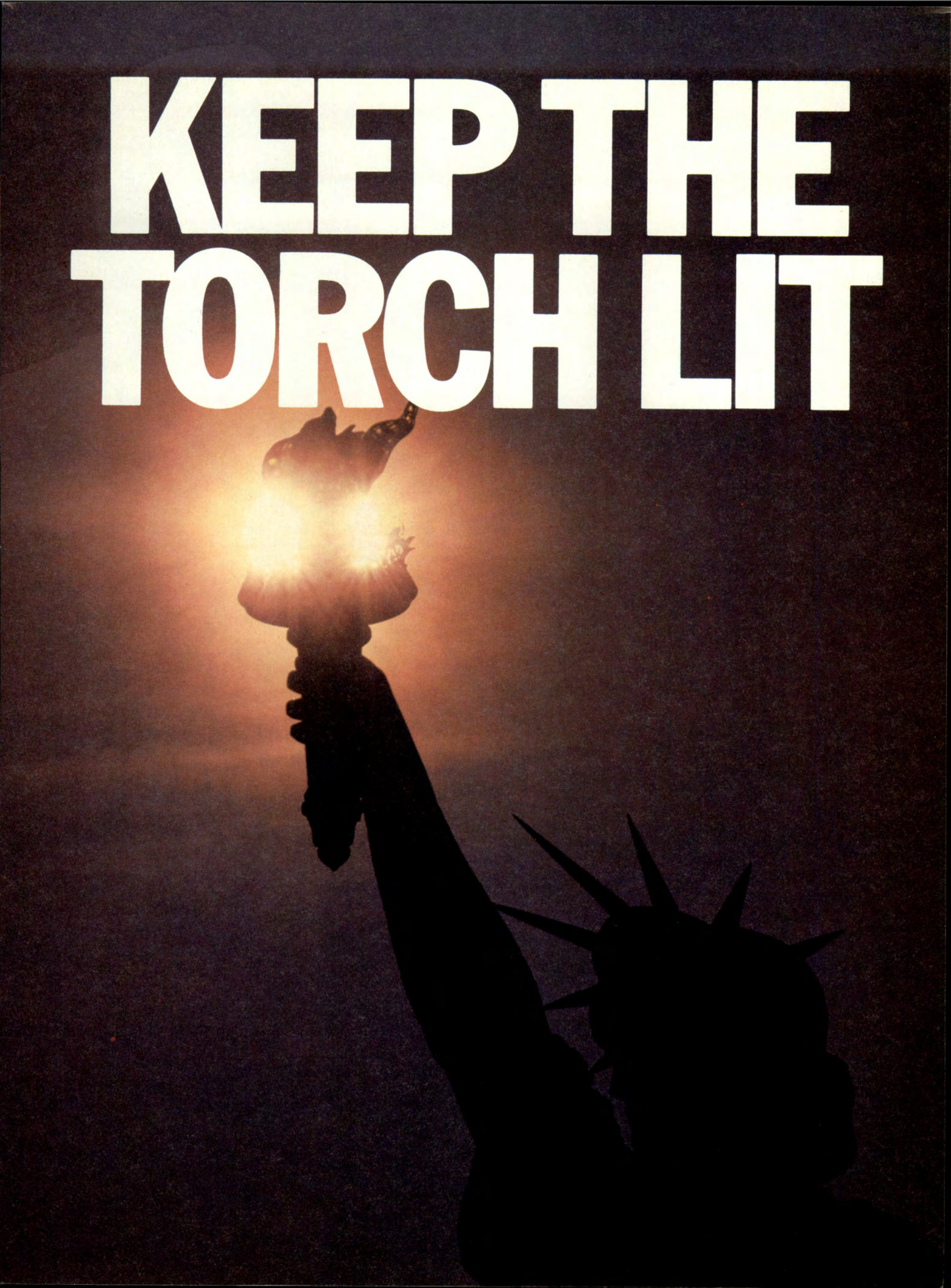
Once the accounts are created and the appropriate papers found in the piles (if only this program included a robot), data can be entered into the accounts via data entry screens.

Each data entry screen allows you to enter the account name; a description or short explanation (limit 20 characters); a three-letter annotation (like TDE for tax-deductible entry); amount; and date. This portion of the program is the key to a successful operation. But, because it requires that you enter every bill and every expenditure (and human nature being what it is), the program may be doomed from the beginning. If you don't plan to be meticulous, don't plan to use this program.

The data can be reviewed for verification at any time by using the VIEW command, which will allow the user to see and correct the entries for any particular account. The LIST option allows the user to view an account's activity and status for single months or over an extended period of time. This feature is particularly useful when watching your clothes account grow to national debt proportions, as your son or daughter prepares to go off to college.

The moment of truth occurs in this program when you prepare to reconcile the budget. You have created your accounts, found and entered your expenses, and are preparing to see if your personal finances are going Chapter 11. This procedure is carried out via the Reconcile Budg-

KEEP THE TORCH LIT





On May 18, 1982, President Ronald Reagan announced the formation of the Statue of Liberty-Ellis Island Centennial Commission and appointed Lee A. Iacocca chairman of the 20-member unit.

"The torch of liberty is in danger of going out."

"Restoration of the Statue of Liberty and Ellis Island is of vital concern to all Americans. The loss of these two landmarks in America's heritage would be a tragedy. But our allowing it to happen would signify an even greater loss in our national spirit.

"That's why I'm delighted that Lee Iacocca has taken on the job of Chairman of the Centennial Commission. His parents were among the 17 million who passed through the Immigration Center and went on to help build our country. Their determination to take responsibility for their own destiny is a heritage all Americans should be proud to keep alive today.

"I know Lee and his commission will do a tremendous job. The initial response to their appeal to business leaders and the public has been wonderful. Now it's time for every American to join in."

Ronald Reagan



The Statue of Liberty, best known symbol of freedom in the world, is every American's to cherish.



A century of fatigue and corrosion has weakened the Statue's frame, eaten holes in the copper skin.



Photos courtesy of Peter B. Kaplan

Ellis Island, where people full of hope stopped being foreigners and started being Americans.

For nearly a hundred years, the Statue of Liberty has stood on the edge of the New World, America's most powerful symbol of freedom and hope. Today the ravages of almost a century of weather and salt air have left their marks. Corrosion has eaten away at the iron framework. New holes continue to appear in the copper sheets that form the exterior.

Less than a mile away, on Ellis Island where the ancestors of nearly half of all Americans first stepped onto American soil, the Great Hall of the Immigration Center is a hollow ruin. Rooms are vandalized, passageways overgrown with vegetation, walls crumbling in decay.

Inspiring plans have been developed to restore the Statue. On Ellis Island, a permanent museum will be established devoted to the history of the island itself and celebrating America's immigrants on both coasts; the diversity of their ethnic origins, the magnitude of their contributions to our nation. But unless restoration is begun now, these two landmarks in our nation's heritage could be closed at the very time America is celebrating their hundredth anniversaries. Sections of the Statue have already been declared unsafe and closed to visitors. The 230 million dollars needed to carry out the work is needed now.

All of the money must come from private donations; the federal government is not raising the funds. This is consistent with the Statue's origins. The French people paid for its creation themselves. And America's businesses spearheaded the public contributions that were needed for its construction and for the pedestal.

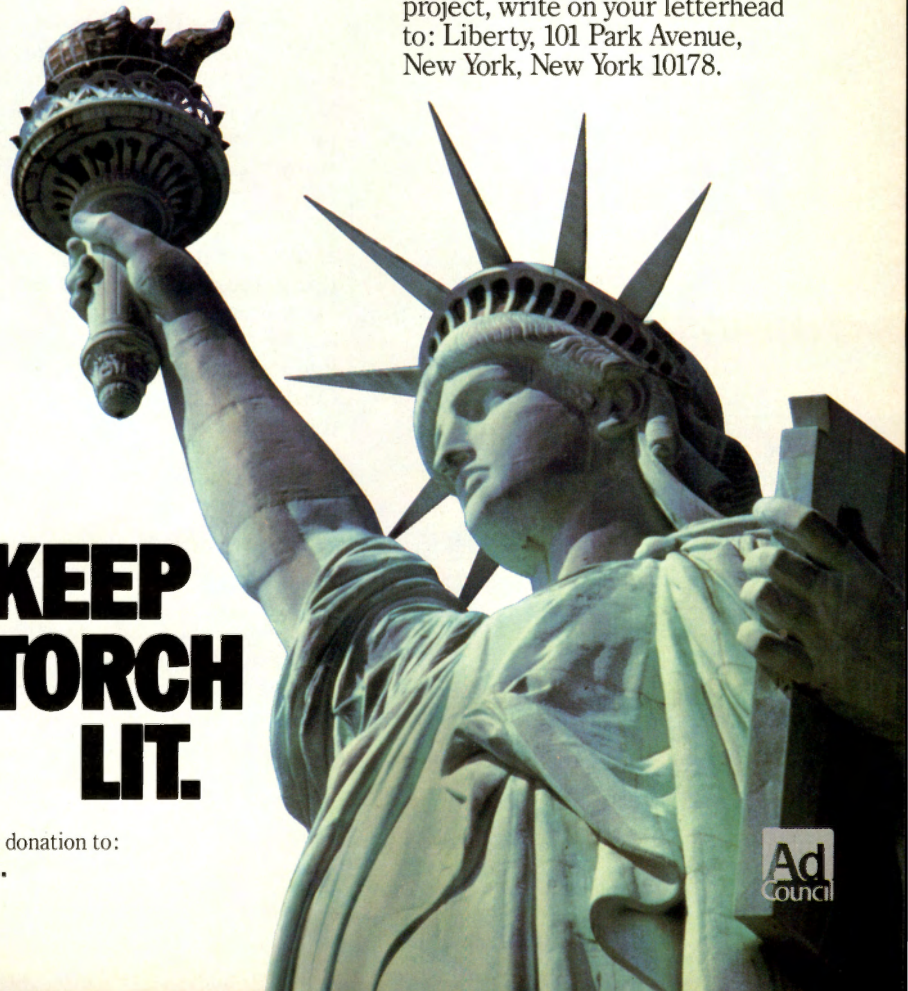
The torch of liberty is everyone's to cherish. Could we hold up our heads as Americans if we allowed the time to come when she can no longer hold up hers?

A copy of the last financial report filed with the Department of State may be obtained by writing to: New York State, Department of State, Office of Charities Regulation, Albany, New York 12231, or the Statue of Liberty-Ellis Island Foundation, 101 Park Avenue, 12th Floor, New York, N.Y. 10178.

Opportunities for Corporate Sponsorship and Employee Participation

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Initial response from corporations to the centennial fund-raising campaign is well under way. Companies such as Chateau Ste. Michelle Winery, Coca-Cola, Kellogg's, Stroh's, U.S. Tobacco, Oscar-Mayer, Kodak, USA Today, Nestle and The Chrysler-Plymouth and Dodge Dealers are already behind the project. To learn more about the advantages of corporate sponsorship and how to set up employee fund-raising programs during the nationwide promotions surrounding the restoration project, write on your letterhead to: Liberty, 101 Park Avenue, New York, New York 10178.



KEEP THE TORCH LIT.

Save these monuments. Send your personal tax deductible donation to:
The Statue of Liberty-Ellis Island Foundation, Inc.
P.O. Box 1986, New York, N.Y. 10018

Ad Council

et Menu. This menu provides for the POSTING function, which takes the amount you have allocated as gross monthly income and distributes it according to your previous instructions into the various accounts.

Utilizing the TALLYING and STATUS functions within the menu, you can now see your accounts summarized by month or extended time periods, with notations for amount spent, amount posted, credits, and balances.

Home budgeting programs exist for virtually all home computers, and are usually one of the justifications people use when purchasing a computer. *Home Budget, jr* is a good application of this type of program, but suffers the fatal flaw of all such programs: data entry. If your desk and files are orderly and neat, and you are a person who enjoys detail, *Home Budget, jr* will be an enjoyable tool for maintaining your home records, preparing for the IRS, or helping to shape a home budget. On the other hand, if you are looking for a miracle that will turn you into an orderly and efficient recorder and filer, you'll be disappointed in this or any other "home productivity" program. *Home Budget, jr* offers a model for budgeting, but can't impose order where chaos reigns.

Stan Silverman *is a project coordinator for Compu-Tech of West Hempstead, New York, where he designs educational materials for computer applications.*

DOW JONES REPORTER

This software accesses an electronic database and news retrieval system.

	Fair	*Good*	*Excellent*
Ease of use		■	
Written instructions		■	
Performance			■
Error handling			■

Price	*$100*
Hardware	*Disk drive; 128K; cartridge BASIC; modem; phone line Dow Jones New Service account*
Terms of Sale	*Limited warranty covers defective disks for 90 days*
Publisher	*IBM, P.O. Box 1328, Boca Raton, FL 33432, (800) 447-4700*

The *Dow Jones Reporter* is a program that has been around for a few years on a wide variety of microcomputers. The program is designed to allow the user to connect directly from home or office into the Dow Jones News and Quotes Service, an electronic information service run by the publishers of *The Wall Street Journal* and *Barron's*. Why did IBM choose this particular program as one of the first to work on the IBM PC*jr*? Perhaps because IBM has set its sights on an upscale market for Junior. The Commodore 64, Radio Shack Color Computer, and others seem to have taken aim at those of us who drive Fords and Chevys and have emphasized the more typical collection of home software, namely games. IBM is after the Audi market and has provided the PC*jr* with an initial library of software appropriate for the leather seat crowds.

Well, not wanting to be considered down-scale I opened my *Dow Jones Reporter* package to start my climb up in the world. The program requires 128K memory; DOS 2.1; cartridge basic; modem; phone line; and an active Dow Jones account. One free hour of on-line time is provided with the program; to open an account simply call (800) 257-5114.

The *Dow Jones Reporter* is a telecommunications package that enables your home computer to act as a terminal to a large main frame computer. The program provides the appropriate commands to enable the two computers to say hello to each other, send messages back and forth, and to transfer data. *Dow Jones Reporter,* like any good communications program, sets up the protocols automatically and requires no user knowledge of telecommunications. Once connected the user can access the following services: "News Requests"; "Current Quotes"; "Historical Quotes"; "Disclosure Online"; "Reqest Display Profile"; and "Manual Entry Mode."

The "News Request" option, which covers financial news and major events that could affect financial markets, allows you to view headlines on the service, the most current story, or a story of specific interest contained within the Dow Jones Data Base. This information may be stored on disk for future financial planning and analysis.

The "Current Quotes" section allows the user to view quotes from any of the following sources: Common/Preferred/Warrants; Corporate Bonds; Mutual Bonds; Options; and U.S. Treasury Notes. The quotes listed are from New York, Pacific, American, and Midwest exchanges. You can also call up a composite quote. There is only a fifteen-minute delay from the actual ticker tape prices. (It was with great excitement that I watched Commodore stock tumble as IBM stock rose.)

The "Historical Quotes" mode allows the financial planner to get quotes on selected stocks for the past quarter month, the most recent twelve days, or the previous thirteen to twenty-four day period.

The "Disclosure Online" choice gives detailed corporate and financial information about any company you select. All but the most obscure company is detailed. This kind of information allows the investor to be more informed about the companies in which he is investing.

The final option available in the main menu, the "Manual Entry Mode," allows the user to make direct entries to the service and to access additional information not available through the menus. For example, should Dow Jones add a new feature, say "stock of the day," you can access this without going through the time-consuming menu functions.

Dow Jones Reporter's written materials would be more helpful to the user if they included more illustrations of screen displays to make the text easily understood. And because it is a telecommunications package, using *Dow Jones Reporter* is no trivial procedure—you can encounter headaches such as interference.

The *Dow Jones Reporter* is not likely to replace your broker. It provides you with information—not advice—and it doesn't allow you to make any financial transactions. However, for the casual stock market player it provides an up-to-the-quarter-hour window into the activities of the financial market. Armed with the information you can secure over the phone line, you may become the next financial wizard on your block, riding about in your Audi; or you may wind up in a 1967 Volkswagen Beetle trying to sell your copy of the *Dow Jones Reporter*.

—Stan Silverman

New Products

Multifunction Expansion Boards

Quadram Corporation has announced PCjr versions of two of its PC expansion boards—Quadboard and Quadlink, Jr. Both come in modules that look identical to the PCjr parallel printer adapter and connect to the Junior through the expansion bus on the right side of the system unit.

The Quadboard boosts Junior's RAM by increments of 64K, 128K, 256K, and 512K. Boards supplying memory expansion of 128K or more come with a calculator-type battery to supplement Junior's power supply. Also included on Quadboard is a clock/calendar and a parallel port. Its retail price is $395.

Quadlink, Jr. allows the PCjr to run most programs written for the Apple II Plus microcomputer. Quadram estimates that Quadlink, Jr. will make 75 percent of all Apple II Plus software compatible with the Junior, but won't work with any Apple IIe programs. Once Quadlink, Jr. is installed, switching between IBM and Apple modes requires only a few keystrokes. Included with the board are a set of utility programs and a copy of Apple DOS 3.3. Apple programs running on the Junior will display text only in 40 column width and in lower case letters. And a PCjr with Quadlink, Jr. will not display Apple graphics on a TV or a composite monitor. Quadlink, Jr. lists for $495. Both boards are available from Quadram Corporation, Dept. PM, 4355 International Blvd., Norcross, GA 30093, (404) 923-6666.

Expansion Units

Legacy Technologies has introduced a series of multifunction expansion units designed to sit on top of the PCjr system unit.

The basic system, called Legacy I, is a steel and plastic cabinet that contains a power supply, an LED display panel, and an expansion bus with four open slots for expansion boards. It costs $395.

Legacy II has a Qume half-height floppy disk drive and disk controller added to the base system and retails for $795.

Legacy III is the base system with an LTL 10-megabyte hard disk and controller card. It lists for $1595.

Legacy also markets a memory expansion board for the PCjr—the Legacy EXP, which adds up to 256K to Junior's memory—and a board with a clock/calendar and parallel and serial ports called the CPS. Each costs $199. For information contact Legacy Technologies, Dept. PM, Suite 100, 1414 O Street, Lincoln, NE 68505, (402) 475-PCJR.

Junior's First Mouse

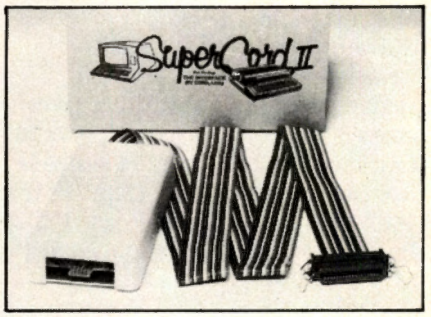
Activating a program command with the PC Mouse is a matter of pointing the hand-held device at the command and pushing one of the mouse's buttons. The PC Mouse comes with "pop-up" menu software—lists of commands that adapt some common spreadsheet and



word processing programs for use with this keyboard substitute, including *VisiCalc*, *MultiPlan*, and *pfs:write*. You can also create your own mouse-accessible menus for other PC and PCjr programs. The optical PC Mouse comes with a light-reflecting pad that monitors the mouse's movements and its own power supply. It costs $295. It connects to the PC or the PCjr with a standard RS-232C interface. Contact: Mouse Systems, Dept. PM, 2336H Walsh Avenue, Santa Clara, CA 95091, (408) 988-0211.

Typewriter Turns Printer

With the SuperCord, the PCjr can use an electric typewriter as its printer. The device works with Adler/Royal, Hermes, Silver Reed, Brother, Facita, and Smith Corona



brand typewriters, which all print from 12-15 characters per second when hooked up to the Junior. Cord Ltd, manufacturer of the SuperCord, recommends that the 20-minute installation be handled by a trained technician. But once the cord is installed, switching the typewriter's identity back and forth from printer to a stand-alone unit is a simple matter of plugging or unplugging one end of the cord. SuperCord costs $295, while SuperCord II, which includes a 4K buffer, sells for $365. Both models connect to Junior with the standard Centronics interface on its optional parallel printer attachment.

SuperCords are available from Cord Ltd., Dept. PM, 2815 Juanipero, Suite 102, Signal Hill, CA 90806, (800) 562-6665.

Keyboard Utility Program

Smartkey II allows PCjr users to make any key on the keyboard do the work of a series of key strokes. Hitting one key can be the equivalent of typing up to 3,000 characters, so that addresses, dates, and other often-repeated text does not have to be typed out each time. Like the function keys at the left of the IBM PC keyboard, this utility also lets users turn two or three stroke commands into one-stroke commands. The 2.25 K utility allows users to reassign

values to the keyboard at any point while running an application program. It costs $89.95 and is available from Software Research Technologies, Dept. PM, 3757 Wilshire Boulevard, Suite 211, Los Angeles, CA 90010, (213) 384-5430.

DISK HEAD DUSTER

Discwasher Clean Runner is a polyester diskette with a surface similar to a dust cloth. When the PC*jr*'s disk head comes in contact with this disk's tracks, it doesn't read or write—it gets cleaned of dust and smoke particles. The dusting takes about 30 seconds. Each disk works 20 times, costs $24.95, and is available from Discwasher, Inc., Dept. PM, 1407 North Providence Road, P.O. Box 6021, Columbia, MO 65205, (314) 449-0941.

ADJUSTABLE MONITOR STAND

The Curtis UNI-1, a support pedestal for any PC*jr*-compatible monitor, allows viewers to see the video display at any angle they choose. The two-inch high base tilts up to 22 degrees and swivels a full 360 degrees. It supports any monitor with feet less than 13 inches apart. Available for $49.95 from Curtis Manufacturing, Dept. PM, 305 Union Street, Peterborough, NH 03458, (603) 924-7803.

WINDOWS FOR JUNIOR

Trillian Computer Corporation now produces a "window" interface specifically for the PC*jr*. The program, called PC*jr VisuALL*, can be used with a mouse or with the Junior's keyboard. *VisuALL*, which works with almost all off-the-shelf application software, creates "windows" containing the programs' commands written out in English. After the user loads the *VisuALL* program into the Junior, he can move the cursor to a command by pointing with a mouse or by pressing a key. The program is available for $69.95 from Trillian Computer Corporation, Dept. PM, 15425 Los Gatos Blvd., Los Gatos, CA 95030, (408) 358-2761.

PEANUT BOOKS

Exploring the IBM PCjr Home Computer explains how the PC*jr* works. It takes a look at operating systems; chips; memory; registers; graphics; sound and communications capabilities of the PC*jr*. The cost is $18.25. By Peter Norton, Microsoft Corporation, Dept. PM, 10700 Northup Way, Bellevue WA 98004, (206) 828-8088.

Using and Programming the IBM PCjr, with 77 Ready-to-Run Programs describes the machine and its capabilities. Along with a discussion of Junior peripherals and software, the book, which costs $11.50, includes music programs written in BASIC. By Frederick Holtz, Tab Books, Inc., Dept. PM, Blue Ridge Summit, PA 17214, (717) 794-2191.

Kids and the IBM PC/PCjr teaches introductory BASIC on the IBM computers. A good number of the book's sample programs make use of the Junior's excellent sound and color capabilities. It sells for $19.95. By Edward H. Carlson, Datamost, Dept. PM, 8943 Fullbright Ave., Chatsworth, CA 91311-2750, (818) 709-1202.

IBM PCjr Favorite Programs Explained presents 40 PC*jr* programs in BASIC and explains how they will run. Programs cover math, problem-solving, games, business, and education. It costs $12.95. By Donald Kreutner, Que Corporation, Dept. PM, 7999 Knue Road, Suite 202, Indianapolis, IN 46250, (317) 842-7162.

The following three books were in a race to be the very first PC*jr* book on the market. They are written primarily for those who are shopping for a PC*jr*.

Introducing the IBM PCjr, by Andrew M. Seybold. $12.95 from Howard W. Sams & Co., Inc., Dept. PM, 4300 West 62nd St., Indianapolis, IN 46268, (317) 298-5400.

Introducing IBM PCjr, by Douglas Ford Cobb and Chris DeVoney. $9.95 from Que Corporation, Dept. PM, 7960 Castleway Drive, Indianapolis, IN 46250, (317) 842-7162.

IBM PCjr Buyer and User Guide, by Larry Joel Goldstein. $9.95 from Robert J. Brady Co., Dept. PM, Bowie, MD 20715, (301) 262-6300.

NEW JUNIOR KEYBOARD



Key Tronic Corporation has come out with a replacement keyboard for the PC*jr*, which features separate cursor-control keys; a numeric pad; function keys across the top; and a cable connection. Its 99 keys, with the characters marked on top, are in the familiar typewriter placement; the function keys come with removable templates. Model KB5151*jr* lists for $255, and is available from Key Tronic Corporation, Dept. PM, P.O. Box 14687, Spokane, WA 99214, (509) 928-8000.

DOS BLUEPRINTS

For help with DOS commands, Onset Services makes BluePrints—poster-sized charts that spell out the different system commands and give examples of when to use them. The set of two DOS posters sells for $12.50. For the same price, Onset offers BluePrints for CP/M, and for $15.00, more extensive posters for *dBase II*, *WordStar*, *SuperCalc*, and *Lotus 1-2-3*. Add $1.50 shipping cost. Write or call: Onset Services, Dept. PM, 318 South B. Street, San Mateo, CA 94402, (415) 573-1919.

HIGH TECH Hot Line



Need further information about products for the PC*jr*? Answers are just a phone call away. These hotline numbers will get you in touch with the manufacturers and dealers of Peanut-related products—conveniently and quickly.

Advanced Electronics Systems, Inc.
800-345-1280
In FL **813-323-2162**
For technical info **717-263-5681**

Amdek **312-364-1180**

Ann Arbor Software **313-769-9088**

Borland International, For credit card orders only **800-227-2400 X968**
In CA **800-772-2666 X968**

Computerland **800-423-3008**
In CA **800-321-1101**

Classroom Consortia Media
800-237-1113
In NY **800-522-2210**

Cuestra Systems, Inc. **805-541-4161**

Duncan-Atwell **201-355-1690**

Harcourt Brace Jovanovich
800-543-1918
In CA Call collect **619-699-6335**

Hartley Courseware **517-646-6458**

IBM PCjr **800-IBM-PCJR**
In AK and HI **800-447-0890**

IBM Personal Software **800-447-4700,**
In AK and HI **800-447-0890**

Key Tronic **509-928-8000**

Leading Edge Products, Inc.
800-343-6833
In MA **617-828-8150**

Meca **203-222-1000 X212**

Micro Information Publishing Inc.
800-328-0196

MultiMate International Corp.
800-243-3142
In CT **203-522-2116**

National Microware **714-752-2344**

PC Link **800-221-0343**
In NY **212-730-8036**

Pronto, the Home Banking System from Chemical Bank, in NY, NJ and CT only **800-782-1100**

SoftCorp Inc. **800-255-PLAN**
In FL **813-799-3984**

Software Strategies Inc. **800-328-7847**

Strictly Soft Ware **614-587-2938**

Tab Books Inc. **800-233-1128**
In PA, HI or AK **717-794-2191**

XOR Corporation **612-938-0005**

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